US009324084B2

(12) **United States Patent**
Henkin et al.

(10) **Patent No.: US 9,324,084 B2**
(45) **Date of Patent: *Apr. 26, 2016**

(54) **SYSTEM AND METHOD FOR REAL-TIME WEB PAGE CONTEXT ANALYSIS FOR THE REAL-TIME INSERTION OF TEXTUAL MARKUP OBJECTS AND DYNAMIC CONTENT**

(75) Inventors: **Assaf Henkin**, Tel Aviv (IL); **Yoav Shaham**, Ramat Hasharon (IL); **Henit Vitos**, San Francisco, CA (US); **Benny Friedman**, Los Altos, CA (US); **Itai Brickner**, Tel Aviv (IL)

(73) Assignee: **Kontera Technologies, Inc.**, Foster City, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/907,183**

(22) Filed: **Oct. 19, 2010**

(65) **Prior Publication Data**

US 2011/0035438 A1 Feb. 10, 2011

Related U.S. Application Data

(63) Continuation of application No. 11/891,436, filed on Aug. 10, 2007, now Pat. No. 7,822,743, which is a

(Continued)

(51) **Int. Cl.**

G06F 17/30	(2006.01)
G06Q 30/02	(2012.01)
G06Q 50/12	(2012.01)

(52) **U.S. Cl.**

CPC ***G06Q 30/02*** (2013.01); ***G06F 17/3089*** (2013.01); ***G06F 17/30867*** (2013.01);

(Continued)

(58) **Field of Classification Search**

CPC G06F 17/30867; G06F 17/3089
USPC 707/705; 705/14; 715/854
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,603,025	A	2/1997	Tabb et al.
5,636,346	A	6/1997	Saxe

(Continued)

FOREIGN PATENT DOCUMENTS

EP	1030247	A2	8/2000
EP	2054789	A2	5/2009

(Continued)

OTHER PUBLICATIONS

"U.S. Appl. No. 11/732,694, Response filed Aug. 3, 2011 to Final Office Action mailed Apr. 28, 2011", 11 pgs.

(Continued)

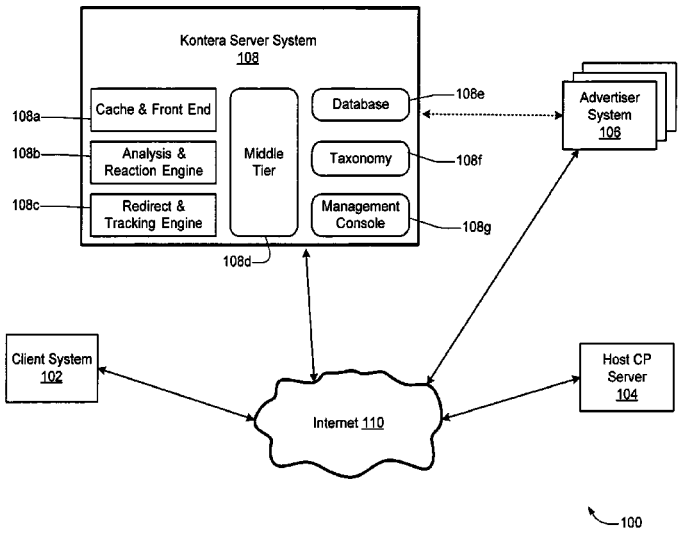
Primary Examiner — Sheree Brown

(74) *Attorney, Agent, or Firm* — Schwegman Lundberg & Woessner, P.A.

(57) **ABSTRACT**

A technique is described for delivering contextual information to end users of a data network which includes at least one client system associated with an end user. According to a specific embodiment, the technique of the present invention provides a contextual-based platform for delivering to an end user in real-time proactive, personalized, contextual information relating to web page content currently being displayed to the user.

37 Claims, 14 Drawing Sheets



Related U.S. Application Data

continuation of application No. 10/977,352, filed on Oct. 28, 2004, now Pat. No. 7,478,089, and a continuation-in-part of application No. 09/943,524, filed on Aug. 29, 2001, now Pat. No. 7,284,008, and a continuation-in-part of application No. 09/943,571, filed on Aug. 29, 2001, now Pat. No. 7,451,099.

(60) Provisional application No. 60/515,627, filed on Oct. 29, 2003, provisional application No. 60/311,418, filed on Aug. 9, 2001, provisional application No. 60/229,452, filed on Aug. 30, 2000.

(52) **U.S. Cl.**
CPC ***G06Q30/0242*** (2013.01); ***G06Q 30/0247*** (2013.01); ***G06Q 30/0254*** (2013.01); ***G06Q 30/0256*** (2013.01); ***G06Q 30/0273*** (2013.01); ***G06Q 30/0277*** (2013.01); ***G06Q 50/12*** (2013.01); *Y10S 707/99931* (2013.01); *Y10S 707/99932* (2013.01); *Y10S 707/99933* (2013.01); *Y10S 707/99934* (2013.01); *Y10S 707/99935* (2013.01); *Y10S 707/99942* (2013.01); *Y10S 707/99944* (2013.01); *Y10S 707/99945* (2013.01)

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,692,132 A 11/1997 Hogan
5,693,132 A 12/1997 Kluttz et al.
5,694,594 A 12/1997 Chang
5,710,884 A 1/1998 Dedrick
5,710,887 A 1/1998 Chelliah et al.
5,712,979 A 1/1998 Graber et al.
5,717,860 A 2/1998 Graber et al.
5,717,923 A 2/1998 Dedrick
5,721,827 A 2/1998 Logan et al.
5,724,424 A 3/1998 Gifford
5,724,521 A 3/1998 Dedrick
5,727,156 A 3/1998 Herr-Hoyman et al.
5,737,619 A 4/1998 Judson
5,740,549 A 4/1998 Reilly et al.
5,751,956 A 5/1998 Kirsch
5,751,969 A 5/1998 Kapoor
5,757,917 A 5/1998 Rose et al.
5,764,906 A 6/1998 Edelstein et al.
5,774,170 A 6/1998 Hite et al.
5,815,830 A 9/1998 Anthony
5,822,539 A 10/1998 van Hoff
5,826,025 A 10/1998 Gramlich
5,848,396 A 12/1998 Gerace
5,848,397 A 12/1998 Marsh et al.
5,895,461 A 4/1999 De La Huerga et al.
5,903,889 A 5/1999 De La Huerga
5,933,811 A 8/1999 Angles et al.
5,948,061 A 9/1999 Merriman et al.
5,959,623 A 9/1999 van Hoff et al.
5,995,943 A 11/1999 Bull et al.
6,041,311 A 3/2000 Chislenko et al.
6,044,376 A * 3/2000 Kurtzman, II
6,061,659 A 5/2000 Murray
6,073,143 A 6/2000 Nishikawa et al.
6,081,829 A 6/2000 Sidana
6,092,074 A 7/2000 Rodkin et al.
6,098,065 A 8/2000 Skillen et al.
6,122,647 A 9/2000 Horowitz et al.
6,134,532 A 10/2000 Lazarus et al.
6,141,010 A * 10/2000 Hoyle 715/854
6,144,944 A * 11/2000 Kurtzman et al. 705/14.54
6,256,631 B1 7/2001 Malcolm
6,266,681 B1 7/2001 Guthrie
6,285,987 B1 9/2001 Roth et al.
6,295,542 B1 9/2001 Corbin
6,311,194 B1 10/2001 Sheth et al.
6,317,781 B1 11/2001 De Boor et al.
6,321,257 B1 11/2001 Kotola et al.
6,334,145 B1 12/2001 Adams et al.
6,421,733 B1 7/2002 Tso et al.
6,434,657 B1 8/2002 Brown
6,466,970 B1 * 10/2002 Lee et al. 709/217
6,507,837 B1 1/2003 De La Huerga
6,516,321 B1 2/2003 De La Huerga
6,578,078 B1 6/2003 Smith et al.
6,581,065 B1 6/2003 Rodkin et al.
6,591,248 B1 7/2003 Nakamura et al.
6,606,652 B1 8/2003 Cohn et al.
6,647,364 B1 11/2003 Yumura et al.
6,725,227 B1 4/2004 Li
6,742,163 B1 5/2004 Ono et al.
6,748,385 B1 6/2004 Rodkin et al.
6,757,661 B1 6/2004 Blaser et al.
6,785,740 B1 8/2004 Yoneda et al.
6,792,430 B1 9/2004 Kenyon et al.
6,848,077 B1 1/2005 McBrearty et al.
6,862,710 B1 3/2005 Marchisio
6,968,332 B1 11/2005 Millic-Frayling et al.
7,110,993 B2 9/2006 Soulanille et al.
7,149,698 B2 12/2006 Guheen et al.
7,165,041 B1 1/2007 Guheen et al.
7,257,585 B2 8/2007 Stevenson et al.
7,284,008 B2 10/2007 Henkin et al.
7,313,588 B1 12/2007 Shotton et al.
7,315,826 B1 1/2008 Guheen et al.
7,437,725 B1 10/2008 Chang et al.
7,451,099 B2 11/2008 Henkin et al.
7,464,381 B1 12/2008 Nickerson et al.
7,478,089 B2 1/2009 Henkin et al.
7,493,553 B1 2/2009 Vora et al.
7,818,319 B2 10/2010 Henkin et al.
7,822,636 B1 10/2010 Ferber et al.
7,822,743 B2 10/2010 Henkin et al.
8,694,480 B2 4/2014 Henkin et al.
8,700,588 B2 4/2014 Henkin et al.
2001/0018704 A1 8/2001 Kikugawa
2002/0035619 A1 3/2002 Dougherty et al.
2002/0035697 A1 3/2002 McCurdy et al.
2002/0052925 A1 5/2002 Kim et al.
2002/0065136 A1 5/2002 Day
2002/0087979 A1 7/2002 Dudkiewicz et al.
2002/0107735 A1 8/2002 Henkin et al.
2002/0111865 A1 8/2002 Middleton
2002/0120505 A1 8/2002 Henkin et al.
2002/0123912 A1 9/2002 Subramanian et al.
2002/0143808 A1 10/2002 Miller et al.
2003/0055831 A1 3/2003 Ryan et al.
2003/0208472 A1 11/2003 Pham
2003/0208483 A1 11/2003 Satomi et al.
2004/0044571 A1 3/2004 Bronnimann et al.
2004/0059708 A1 3/2004 Dean et al.
2004/0073568 A1 4/2004 Yonaha
2004/0083211 A1 4/2004 Bradford
2004/0093327 A1 5/2004 Anderson et al.
2004/0260767 A1 12/2004 Kedem et al.
2005/0004909 A1 1/2005 Stevenson et al.
2005/0033641 A1 2/2005 Jha et al.
2005/0137939 A1 6/2005 Calabria et al.
2005/0149395 A1 7/2005 Henkin et al.
2006/0293951 A1 12/2006 Patel et al.
2007/0118803 A1 5/2007 Walker et al.
2007/0143266 A1 6/2007 Tang et al.
2008/0016059 A1 1/2008 Henkin et al.
2008/0016109 A1 1/2008 Henkin et al.
2008/0046415 A1 2/2008 Henkin et al.
2008/0114755 A1 5/2008 Wolters et al.
2008/0228675 A1 9/2008 Duffy et al.
2008/0250060 A1 10/2008 Grois
2009/0012869 A1 1/2009 Henkin et al.
2009/0024719 A1 1/2009 Wyler et al.
2009/0031311 A1 1/2009 Chang et al.
2009/0048978 A1 2/2009 Ginter et al.
2009/0164949 A1 6/2009 Henkin et al.
2009/0254971 A1 10/2009 Herz et al.
2010/0138271 A1 6/2010 Henkin et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2010/0138451	A1	6/2010	Henkin et al.
2010/0138452	A1	6/2010	Henkin et al.
2010/0174607	A1	7/2010	Henkin et al.
2011/0035439	A1	2/2011	Henkin et al.
2011/0035440	A1	2/2011	Henkin et al.
2011/0213655	A1	9/2011	Henkin et al.

FOREIGN PATENT DOCUMENTS

WO	WO-95/05066	A1	10/1999
WO	WO-01/86390	A2	11/2001
WO	WO-02/19175	A2	3/2002
WO	WO-2005/003920	A2	1/2005
WO	WO-2005025252	A2	3/2005
WO	WO-2005094098	A1	10/2005
WO	WO-2007/123783	A2	11/2007
WO	WO-2007/123783	A3	11/2007
WO	WO-2010/085773	A1	7/2010

OTHER PUBLICATIONS

"U.S. Appl. No. 11/732,694, Advisory Action mailed Jul. 21, 2011", 3 pgs.
"U.S. Appl. No. 11/732,694, Final Office Action mailed Apr. 28, 2011", 26 pgs.
"U.S. Appl. No. 11/732,694, Response filed May 23, 2011 to Final Office Action mailed Apr. 28, 2011", 13 pgs.
"U.S. Appl. No. 11/732,694, Response filed Feb. 16, 2011 to Non Final Office Action mailed Sep. 16, 2010", 13 pgs.
"U.S. Appl. No. 11/891,435, Final Office Action mailed Aug. 19, 2011", 21 pgs.
"U.S. Appl. No. 11/891,435, Non Final Office Action mailed Feb. 22, 2011", 14 pgs.
"U.S. Appl. No. 11/891,435, Response filed May 23, 2011 to Non Final Office Action mailed Feb. 22, 2011", 11 pgs.
"U.S. Appl. No. 11/891,437, Final Office Action mailed Aug. 19, 2011", 23 pgs.
"U.S. Appl. No. 11/891,437, Non Final Office Action mailed Feb. 23, 2011", 10 pgs.
"U.S. Appl. No. 11/891,437, Response filed May 23, 2011 to Non Final Office Action mailed Feb. 23, 2011", 7 pgs.
"U.S. Appl. No. 12/212,512, Non Final Office Action mailed May 3, 2011", 14 pgs.
"U.S. Appl. No. 12/212,512, Response filed Feb. 24, 2011 to Non Final Office Action mailed Oct. 1, 2010", 11 pgs.
"U.S. Appl. No. 12/340,464, Non Final Office Action mailed Mar. 31, 2011", 8 pgs.
"International Application Serial No. PCT/US2010/022021, International Preliminary Report on Patentability mailed Aug. 4, 2011", 7 pgs.
"International Application Serial No. PCT/US2010/022021, International Search Report and Written Opinion mailed Mar. 9, 2010".
"U.S. Appl. No. 11/732,694 Non-Final Office Action mailed Sep. 16, 2010", 26 pgs.
"U.S. Appl. No. 09/943,524, Amendment A filed Jan. 18, 2005", 17 pgs.
"U.S. Appl. No. 09/943,524, Amendment B filed Aug. 10, 2005", 16 pgs.
"U.S. Appl. No. 09/943,524, Amendment C filed Feb. 14, 2006", 22 pgs.
"U.S. Appl. No. 09/943,524, Amendment D filed Aug. 22, 2006", 6 pgs.
"U.S. Appl. No. 09/943,524, Final Office Action mailed May 2, 2006", 22 pgs.
"U.S. Appl. No. 09/943,524, Final Office Action mailed May 13, 2005", 16 pgs.
"U.S. Appl. No. 09/943,524, Interview Summary dated Feb. 2, 2006", 2 pgs.
"U.S. Appl. No. 09/943,524, Interview Summary dated Oct. 13, 2006", 3 pgs.
"U.S. Appl. No. 09/943,524, Interview Summary mailed Jan. 19, 2005", 1 pg.
"U.S. Appl. No. 09/943,524, Interview Summary mailed Jul. 7, 2005", 1 pg.
"U.S. Appl. No. 09/943,524, Non-Final Office Action mailed Aug. 23, 2004", 14 pgs.
"U.S. Appl. No. 09/943,524, Non-Final Office Action mailed Nov. 21, 2005", 18 pgs.
"U.S. Appl. No. 09/943,524, Notice of Allowance mailed Jul. 25, 2007", 5 pgs.
"U.S. Appl. No. 09/943,524, Office Action mailed Aug. 23, 2004".
"U.S. Appl. No. 09/943,524, Supplemental Amendment filed Oct. 12, 2006", 29 pgs.
"U.S. Appl. No. 09/943,571, Amendment filed Apr. 15, 2008 in response to Non-Final Office Action mailed Oct. 15, 2007", 23 pgs.
"U.S. Appl. No. 09/943,571, Interview Summary mailed May 9, 2008", 3 pgs.
"U.S. Appl. No. 09/943,571, Interview Summary mailed Aug. 11, 2008", 5 pgs.
"U.S. Appl. No. 09/943,571, Non-Final Office Action mailed Oct. 15, 2007", 10 pgs.
"U.S. Appl. No. 09/943,571, Notice of Allowance mailed Aug. 21, 2008", 8 pgs.
"U.S. Appl. No. 09/943,571, Preliminary Amendment filed Mar. 19, 2007", 7 pgs.
"U.S. Appl. No. 09/943,571, Response to Examiner's Proviisional Oviousness—Type Double Patenting Rejection, mailed Aug. 12, 2008", Re Double patenting rejection, Re Double Patenting Rejection, 4 pgs.
"U.S. Appl. No. 09/943,571, Response to Restriction Requirement, filed Aug. 30, 2007", 6 pgs.
"U.S. Appl. No. 09/943,571, Restriction Requirement mailed Jan. 25, 2007", 1 pg.
"U.S. Appl. No. 10/977,352, Amendment filed Jul. 25, 2008 to Final Office Action mailed Feb. 5, 2008", 13 pgs.
"U.S. Appl. No. 10/977,352, Amendment filed Nov. 8, 2007 to Non-Final Office Action mailed May 11, 2007", 13 pgs.
"U.S. Appl. No. 10/977,352, Final Office Action mailed Feb. 5, 2008", 12 pgs.
"U.S. Appl. No. 10/977,352, Interview Summary (allowed claims) mailed Sep. 18, 2008", RE allowed claims, 15 pgs.
"U.S. Appl. No. 10/977,352, Non-Final Office Action mailed May 11, 2007", 13 pgs.
"U.S. Appl. No. 10/977,352, Notice of Allowance mailed Sep. 29, 2008", 19 pgs.
"U.S. Appl. No. 10/977,352, Office Action mailed May 11, 2007".
"U.S. Appl. No. 11/732,694, Response to Restriction Requirement, filed Aug. 24, 2010".
"U.S. Appl. No. 11/732,694, Restriction Requirement mailed Jun. 24, 2010", 7 pgs.
"U.S. Appl. No. 11/881,430, Amendment B fled Nov. 30, 2006", 23 pgs.
"U.S. Appl. No. 11/881,430, Final Office Action mailed Feb. 18, 2010", 6 pgs.
"U.S. Appl. No. 11/881,430, Non-Final Office Action mailed May 29, 2009", 10 pgs.
"U.S. Appl. No. 11/881,430, Notice of Allowance mailed Jun. 1, 2010", 7 pgs.
"U.S. Appl. No. 11/881,430, Preliminary Amendment (Amendment A) filed Oct. 2, 2007", 5 pgs.
"U.S. Appl. No. 11/881,430, Response filed Apr. 14, 2010 to Final Office Action mailed Feb. 18, 2010", 9 pgs.
"U.S. Appl. No. 11/891,435 Restriction Requirement mailed Sep. 16, 2010", 7 pgs.
"U.S. Appl. No. 11/891,436, Amendment A filed Nov. 26, 2009 to Non-Final Office Action mailed May 27, 2009", 21 pgs.
"U.S. Appl. No. 11/891,436, Final Office Action mailed Mar. 19, 2010", 6 pgs.
"U.S. Appl. No. 11/891,436, Non-Final Office Action mailed May 27, 2009", 10 pgs.
"U.S. Appl. No. 11/891,436, Notice of Allowance mailed Jun. 18, 2010", 8 Pgs.

(56) **References Cited**

OTHER PUBLICATIONS

"U.S. Appl. No. 11/891,436, Response Filed May 19, 2010 to Final Office Action mailed Mar. 19, 2010", 14 pgs.
"U.S. Appl. No. 11/891,437 Restriction Requirement mailed Sep. 16, 2010", 7 pgs.
"U.S. Appl. No. 11/891,578, Amendment B, filed May 30, 2009", 17 pgs.
"U.S. Appl. No. 11/891,578, Final Office Action mailed Feb. 18, 2010", 5 pgs.
"U.S. Appl. No. 11/891,578, Non Final Office Action mailed May 29, 2009", 10 pgs.
"U.S. Appl. No. 11/891,578, Notice of Allowance mailed Jun. 1, 2010", 7 pgs.
"U.S. Appl. No. 11/891,578, Preliminary Amendment filed Oct. 2, 2007", 1 pg.
"U.S. Appl. No. 11/891,578, Response filed Apr. 14, 2010 to Final Office Action mailed Feb. 18, 2010", 11 pgs.
"U.S. Appl. No. 12/295,854, Preliminary Amendment filed Oct. 2, 2008", 3 pgs.
"U.S. Appl. No. 12/212,512 Non-Final Office Action mailed Oct. 1, 2010", 5 pgs.
"International Application Serial No. PCT/US2007/008042, International Search Report and Written Opinion mailed Sep. 19, 2008", (Sep. 19, 2008), 11 pgs.
Baldwin, Paul, "Feed the information bug with Flyswat", [Online] http://articles.techrepublic.com.com/5100-10878_11-5032179.
html, (Published on Feb. 22, 2000 and accessed on Apr. 5, 2010), 6 pgs.
Catherine Marshall, et al., "Spatial Hypertext: Designing for Change", ACM, (Aug. 1995), 88-97.
Challenger, Jim, et al., "A scalable and highly available system for serving dynamic data at frequently accessed web sites", ACM, (Nov. 1998), 1-30 pages.
Kobayashi, Mei, et al., "Information Retrieval on the Web", ACM, (Jun. 2000), 144-173 pages.
Lemay, Laura, "Teach Yourself Web Publishing with HTML 4 in 14 Days", Sams.net Publishing, Second Professional Referenced Edition, (1997), 637-651.
"U.S. Appl. No. 11/891,435, Response filed Feb. 21, 2012 to Final Office Action mailed Aug. 19, 2011", 11 pgs.
"U.S. Appl. No. 11/891,437, Response filed Feb. 21, 2012 to Final Office Action mailed Aug. 9, 2011", 9 pgs.
"U.S. Appl. No. 12/212,512, Response filed Nov. 3, 2011 to Non Final Office Action mailed May 3, 2011", 12 pgs.
"U.S. Appl. No. 12/212,512, Final Office Action mailed Dec. 5, 2011", 20 pgs.
"U.S. Appl. No. 12/340,464, Response filed Aug. 31, 2011 to Non Final Office Action mailed Mar. 31, 2011", 6 pgs.
"U.S. Appl. No. 12/340,464, Non Final Office Action mailed Oct. 31, 2011", 9 pgs.
"U.S. Appl. No. 12/693,433, Non Final Office Action mailed Feb. 27, 2012", 37 pgs.
"U.S. Appl. No. 12/910,264, Non Final Office Action mailed Mar. 8, 2012", 19 pgs.
"U.S. Appl. No. 12/910,337, Non Final Office Action mailed Mar. 8, 2012", 13 pgs.
Dougherty, C. D., et al., "Specification of U.S. Appl. No. 09/631,439, filed Aug. 2, 2000", 1-59.
"U.S. Appl. No. 09/542,496, Non-Final Office Action mailed Jul. 9, 2002", 13 pgs.
"U.S. Appl. No. 11/891,435, Response filed Feb. 18, 2011 to Restriction Requirement mailed Sep. 16, 2010", 5 pgs.
"U.S. Appl. No. 11/891,437, Response filed Jan. 18, 2011 to Restriction Requirement mailed Sep. 16, 2010", 4 pgs.
"U.S. Appl. No. 12/295,854, Response filed Mar. 11, 2013 to Restriction Requirement mailed Sep. 10, 2012", 11 pgs.
"U.S. Appl. No. 12/295,854, Restriction Requirement mailed Sep. 10, 2012", 6 pgs.
"U.S. Appl. No. 12/693,433, Final Office Action mailed Nov. 9, 2012", 34 pgs.
"U.S. Appl. No. 12/693,433, Preliminary Amendment filed Jan. 27, 2011", 12 pgs.
"U.S. Appl. No. 12/693,433, Response filed Aug. 27, 2012 to Non Final Office Action mailed Feb. 27, 2012", 14 pgs.
"U.S. Appl. No. 12/910,264, Examiner Interview Summary mailed Mar. 5, 2013", 3 pgs.
"U.S. Appl. No. 12/910,264, Final Office Action mailed Sep. 24, 2012", 20 pgs.
"U.S. Appl. No. 12/910,264, Non Final Office Action mailed Apr. 12, 2013", 21 pgs.
"U.S. Appl. No. 12/910,264, Preliminary Amendment filed Oct. 22, 2010", 5 pgs.
"U.S. Appl. No. 12/910,264, Response filed Mar. 25, 2013 to Final Office Action mailed Sep. 24, 2012", 12 pgs.
"U.S. Appl. No. 12/910,264, Response filed Aug. 8, 2012 to Non Final Office Action mailed Mar. 8, 2012", 14 pgs.
"U.S. Appl. No. 12/910,264, Supplemental Preliminary Amendment filed Feb. 4, 2011", 8 pgs.
"U.S. Appl. No. 12/910,337, Examiner Interview Summary mailed Mar. 5, 2013", 3 pgs.
"U.S. Appl. No. 12/910,337, Final Office Action mailed Oct. 18, 2012", 15 pgs.
"U.S. Appl. No. 12/910,337, Non Final Office Action mailed Apr. 12, 2013", 15 pgs.
"U.S. Appl. No. 12/910,337, Preliminary Amendment filed Oct. 22, 2010", 5 pgs.
"U.S. Appl. No. 12/910,337, Response filed Apr. 2, 2013 to Final Office Action mailed Oct. 18, 2012", 10 pgs.
"U.S. Appl. No. 12/910,337, Response filed Aug. 8, 2012 to Non Final Office Action mailed Mar. 8, 2012", 10 pgs.
"U.S. Appl. No. 12/910,337, Supplemental Preliminary Amendment filed Feb. 4, 2011", 8 pgs.
"European Application Serial No. 07754552.3, Extended European Search Report mailed Dec. 14, 2012", 5 pgs.
"European Application Serial No. 07754552.3, Office Action mailed Jan. 2, 2013", 1 pg.
U.S. Appl. No. 11/732,694, Non Final Office Action mailed Apr. 7, 2014, 46 pgs.
U.S. Appl. No. 11/891,435, Non Final Office Action mailed Apr. 8, 2014, 38 pgs.
U.S. Appl. No. 11/891,437, Non Final Office Action mailed Apr. 7, 2014, 27 pgs.
U.S. Appl. No. 12/295,854, Final Office Action mailed Mar. 7, 2014, 9 pgs.
U.S. Appl. No. 12/295,854, Non Final Office Action mailed Jun. 17, 2013, 11 pgs.
U.S. Appl. No. 12/295,854, Response filed Dec. 17, 2013 to Non Final Office Action mailed Jun. 17, 2013, 14 pgs.
U.S. Appl. No. 12/693,433, Response filed Dec. 9, 2013 to Final Office Action mailed Nov. 9, 2012, 14 pgs.
U.S. Appl. No. 12/693,433, Decision on Pre-Appeal Brief Request mailed May 24, 2013, 2 pgs.
U.S. Appl. No. 12/693,433, Pre-Appeal Brief Request filed May 9, 2013, 5 pgs.
U.S. Appl. No. 12/910,264, Notice of Allowance mailed Nov. 19, 2013, 11 pgs.
U.S. Appl. No. 12/910,264, Response filed Oct. 15, 2013 to Non Final Office Action mailed Apr. 12, 2013, 11 pgs.
U.S. Appl. No. 12/910,337, Response filed Oct. 15, 2013 to Non Final Office Action mailed Apr. 12, 2013, 11 pgs.
U.S. Appl. No. 12/910,337, Notice of Allowance mailed Nov. 15, 2013, 10 pgs.
"Semantic advertising", [Online] Retrieved From Internet: <http://en.wikipedia.org/wiki/semantic_advertising>, (2008).
Liu, Xueqing, et al., "Automatic Taxonomy Construction from Keywords", (1999).
Yih, Wen-Tau, et al., "Finding advertising keywords on web pages", Proceedings of the 15th International Conference on World Wide Web, (2006), 213-222.

* cited by examiner

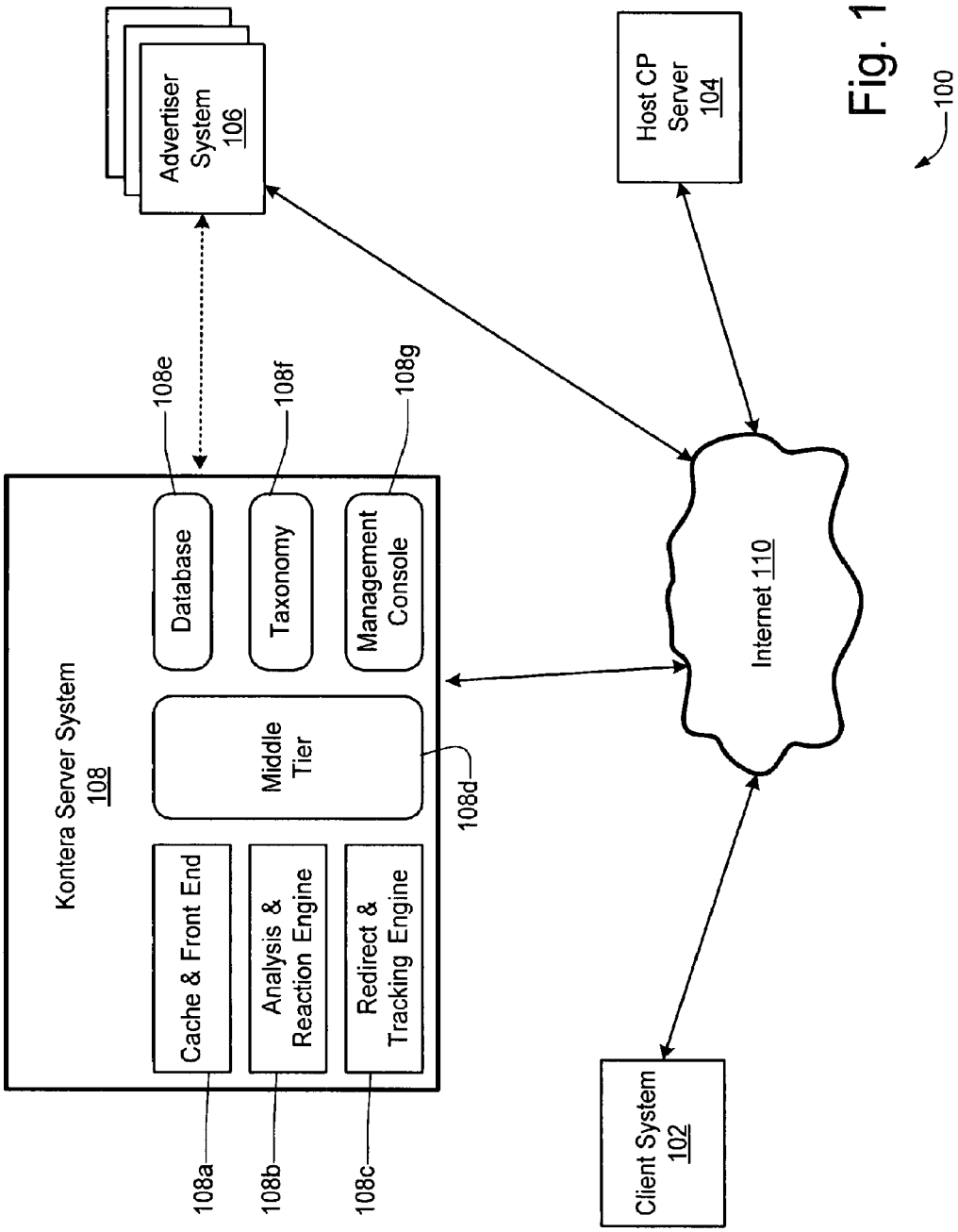

Advertiser System 106
Host CP Server 104
100
108e
108f
108g
Database
Taxonomy
Management Console
Kontera Server System 108
Middle Tier
108d
Internet 110
Cache & Front End
Analysis & Reaction Engine
Redirect & Tracking Engine
108a
108b
108c
Client System 102

Fig. 1

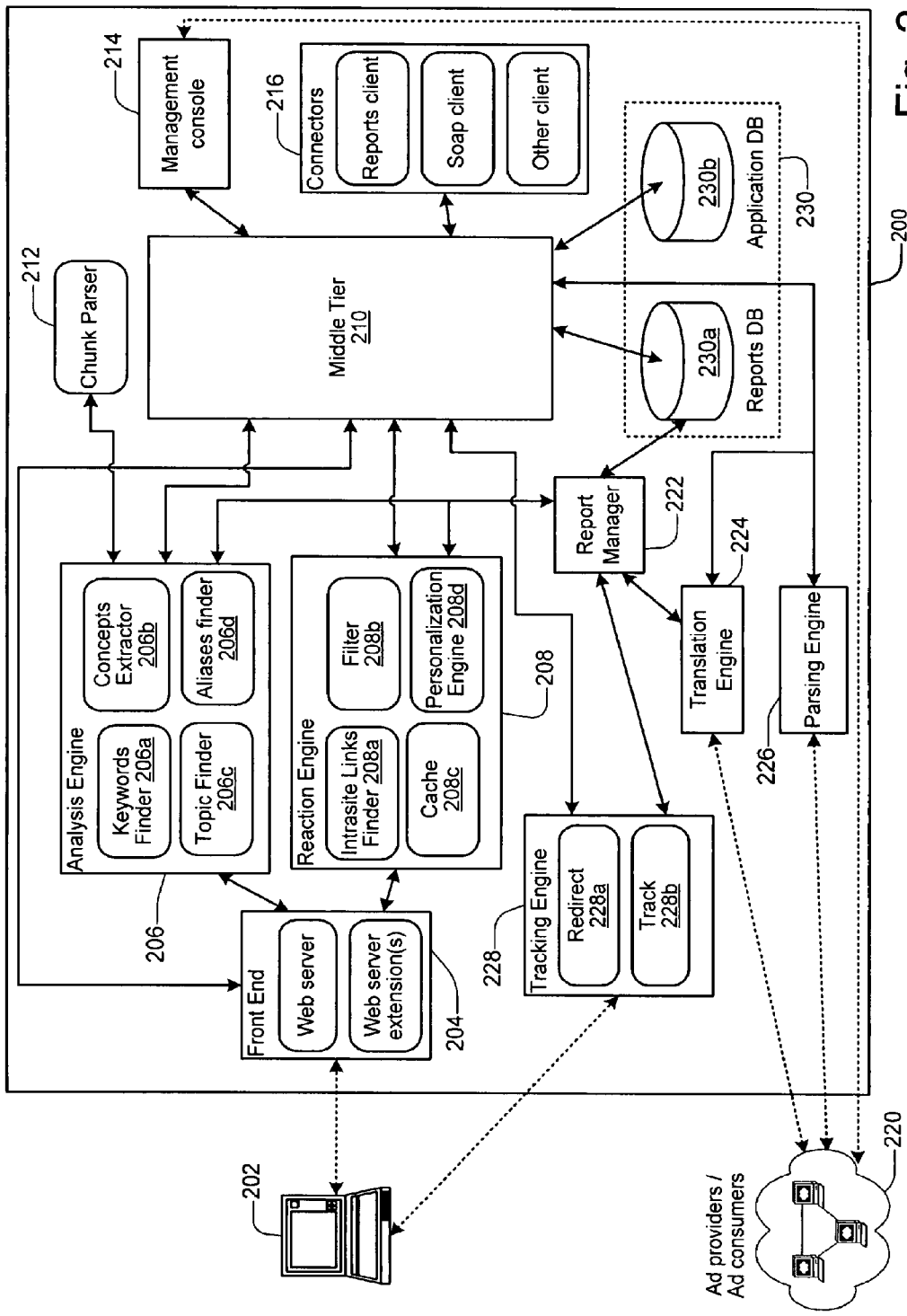

Management console
214
Connectors
216
Reports client
Soap client
Other client
Application DB
230
230b
Reports DB
230a
200
Chunk Parser
212
Middle Tier
210
Report Manager
222
224
Translation Engine
Parsing Engine
226
Analysis Engine
Concepts Extractor 206b
Aliases finder 206d
Keywords Finder 206a
Topic Finder 206c
206
Reaction Engine
Filter 208b
Personalization Engine 208d
Intrasite Links Finder 208a
Cache 208c
208
Tracking Engine
Redirect 228a
Track 228b
228
Front End
Web server
Web server extension(s)
204
202
Ad providers / Ad consumers
220

Fig. 2

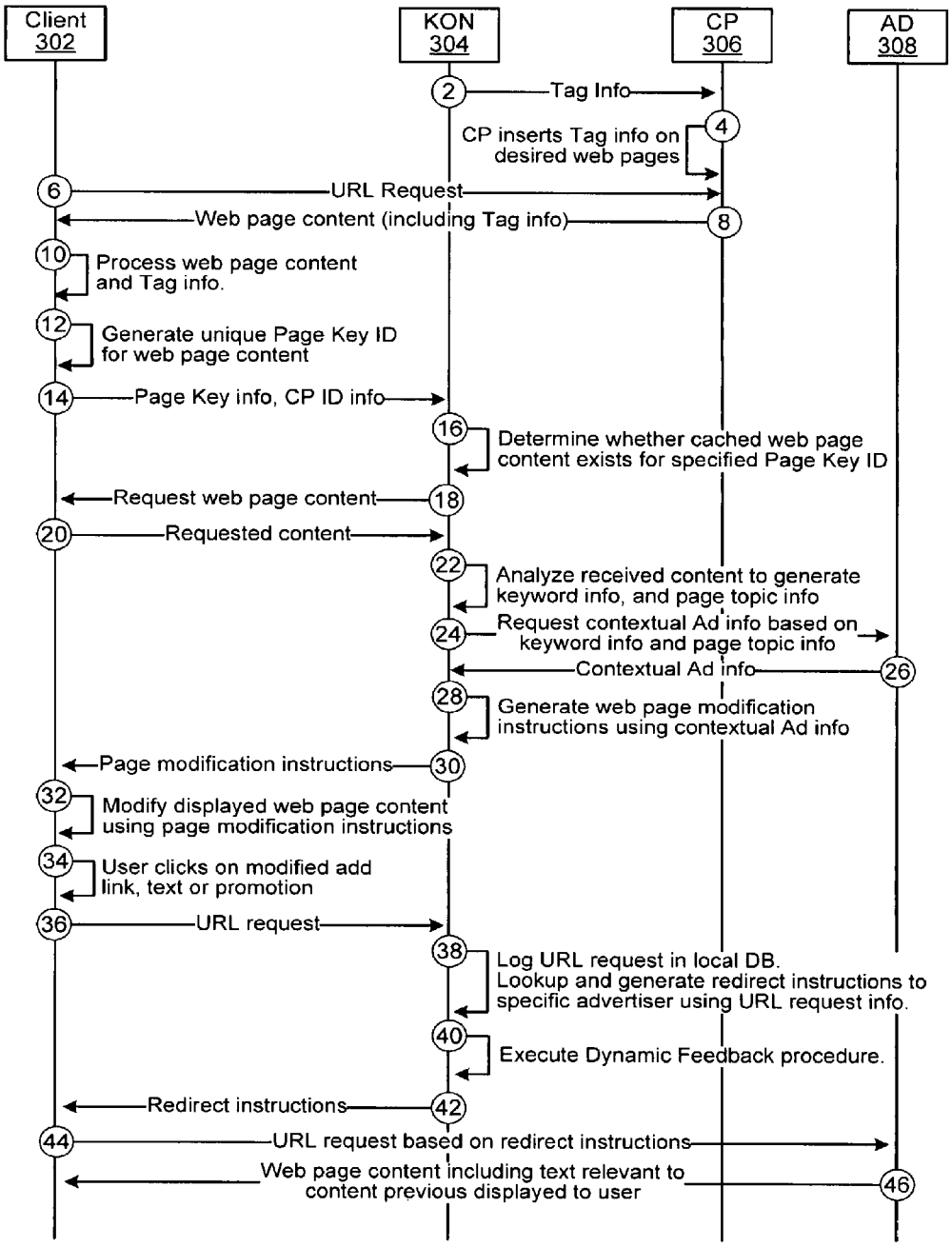

Client 302
KON 304
CP 306
AD 308
2 Tag Info
4 CP inserts Tag info on desired web pages
6 URL Request
8 Web page content (including Tag info)
10 Process web page content and Tag info.
12 Generate unique Page Key ID for web page content
14 Page Key info, CP ID info
16 Determine whether cached web page content exists for specified Page Key ID
18 Request web page content
20 Requested content
22 Analyze received content to generate keyword info, and page topic info
24 Request contextual Ad info based on keyword info and page topic info
26 Contextual Ad info
28 Generate web page modification instructions using contextual Ad info
30 Page modification instructions
32 Modify displayed web page content using page modification instructions
34 User clicks on modified add link, text or promotion
36 URL request
38 Log URL request in local DB. Lookup and generate redirect instructions to specific advertiser using URL request info.
40 Execute Dynamic Feedback procedure.
42 Redirect instructions
44 URL request based on redirect instructions
46 Web page content including text relevant to content previous displayed to user
300

Fig. 3

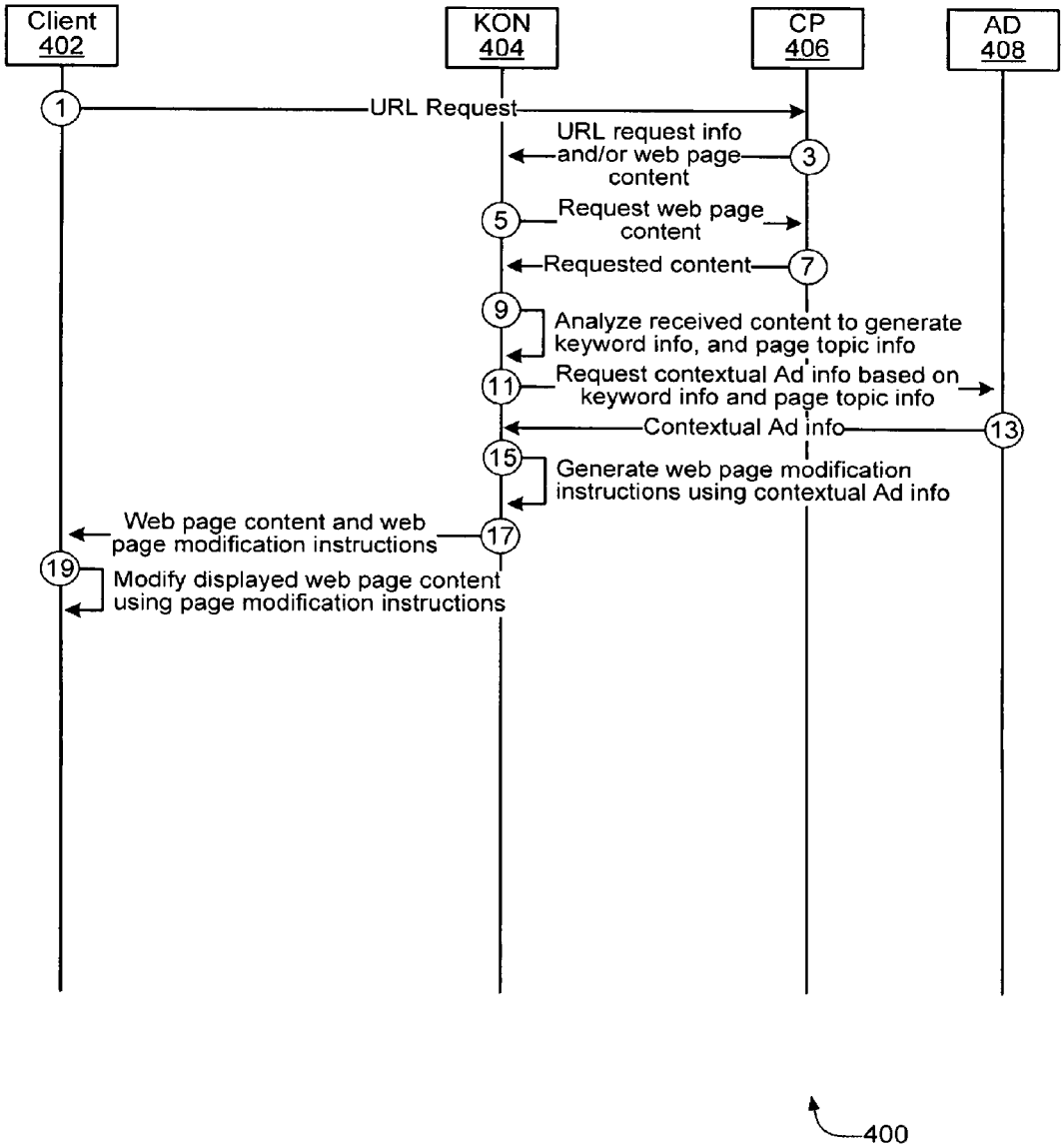

Client
402
KON
404
CP
406
AD
408
1
URL Request
URL request info
and/or web page
content
3
5
Request web page
content
Requested content
7
9
Analyze received content to generate
keyword info, and page topic info
11
Request contextual Ad info based on
keyword info and page topic info
Contextual Ad info
13
15
Generate web page modification
instructions using contextual Ad info
Web page content and web
page modification instructions
17
19
Modify displayed web page content
using page modification instructions
400

Fig. 4

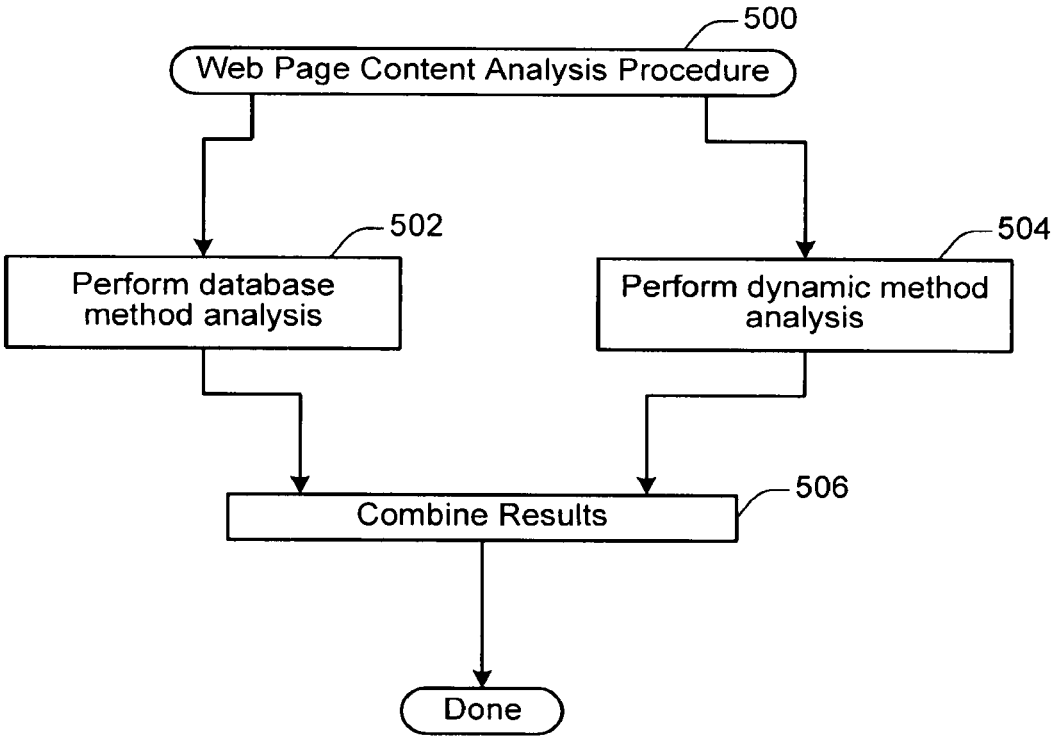

500
Web Page Content Analysis Procedure
502
Perform database method analysis
504
Perform dynamic method analysis
506
Combine Results
Done

Fig. 5

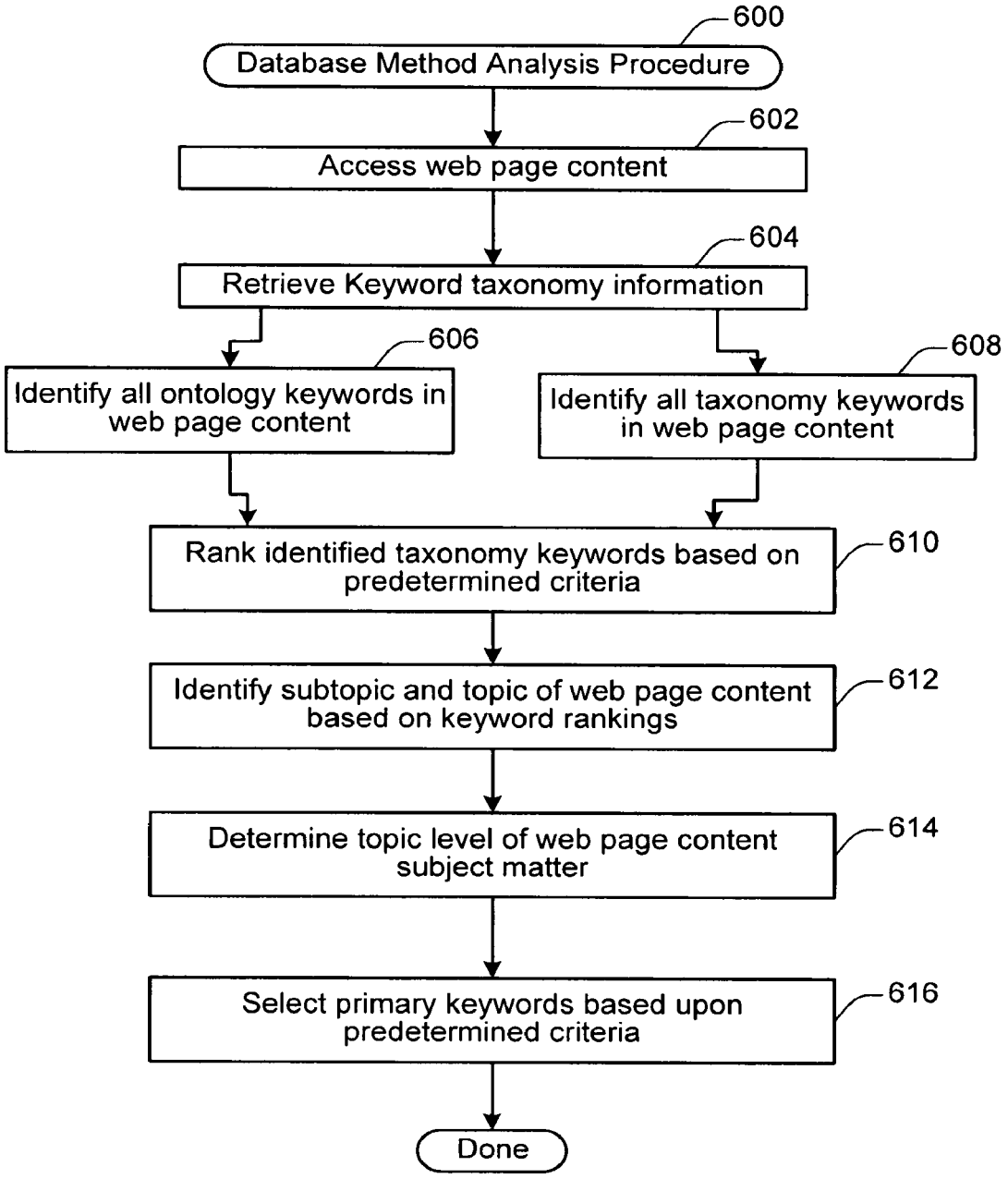

600
Database Method Analysis Procedure
602
Access web page content
604
Retrieve Keyword taxonomy information
606
Identify all ontology keywords in web page content
608
Identify all taxonomy keywords in web page content
610
Rank identified taxonomy keywords based on predetermined criteria
612
Identify subtopic and topic of web page content based on keyword rankings
614
Determine topic level of web page content subject matter
616
Select primary keywords based upon predetermined criteria
Done

Fig. 6

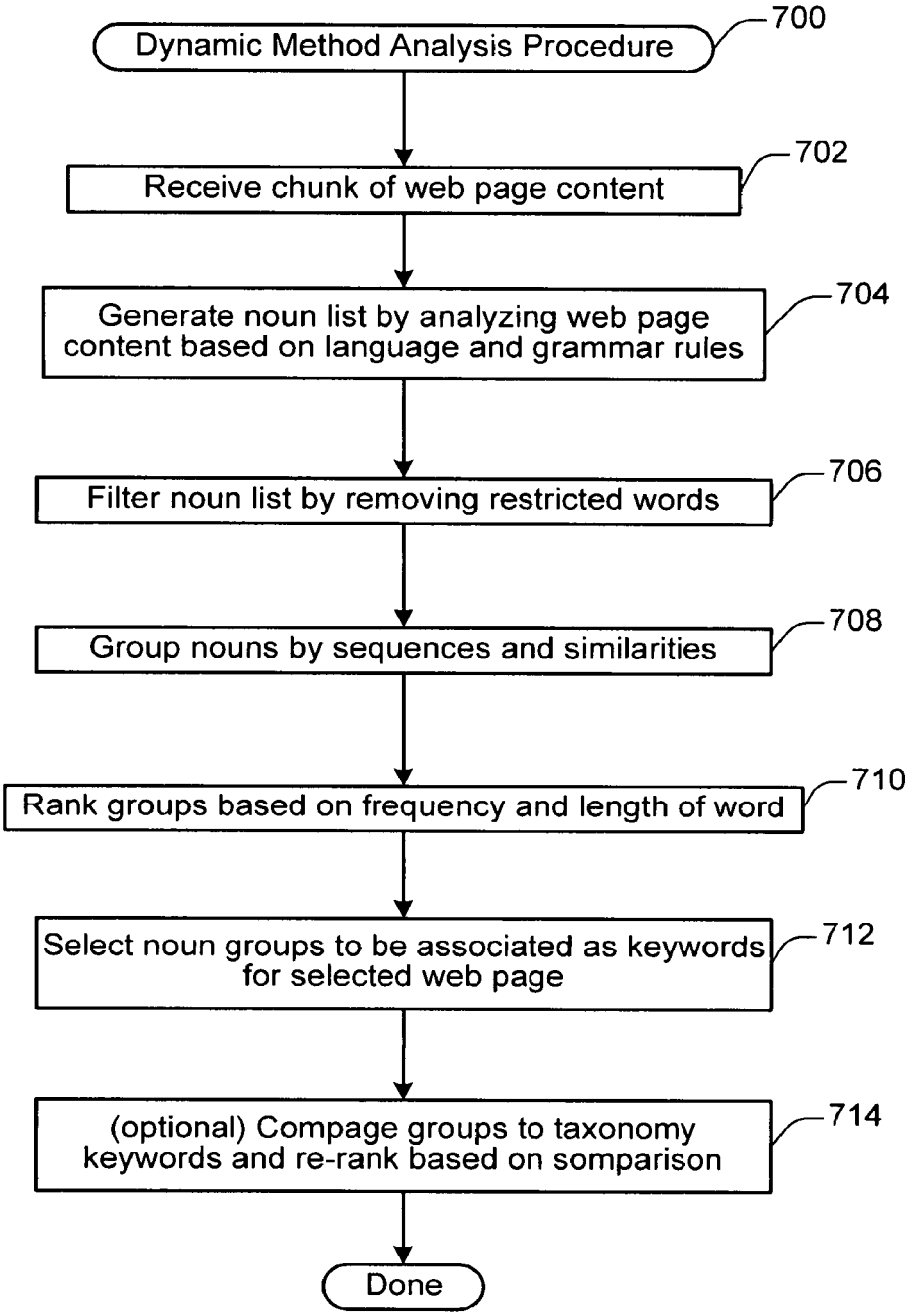

Dynamic Method Analysis Procedure
700
Receive chunk of web page content
702
Generate noun list by analyzing web page content based on language and grammar rules
704
Filter noun list by removing restricted words
706
Group nouns by sequences and similarities
708
Rank groups based on frequency and length of word
710
Select noun groups to be associated as keywords for selected web page
712
(optional) Compage groups to taxonomy keywords and re-rank based on somparison
714
Done

Fig. 7

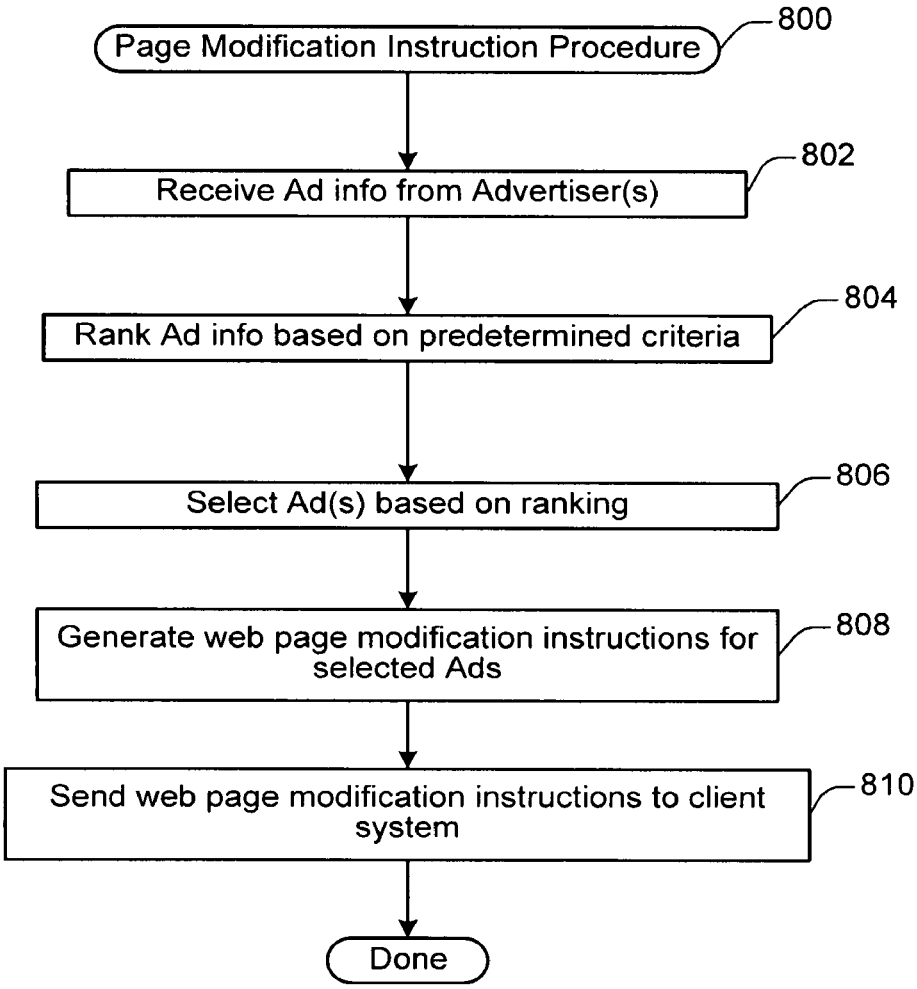

Page Modification Instruction Procedure
800
Receive Ad info from Advertiser(s)
802
Rank Ad info based on predetermined criteria
804
Select Ad(s) based on ranking
806
Generate web page modification instructions for selected Ads
808
Send web page modification instructions to client system
810
Done

Fig. 8

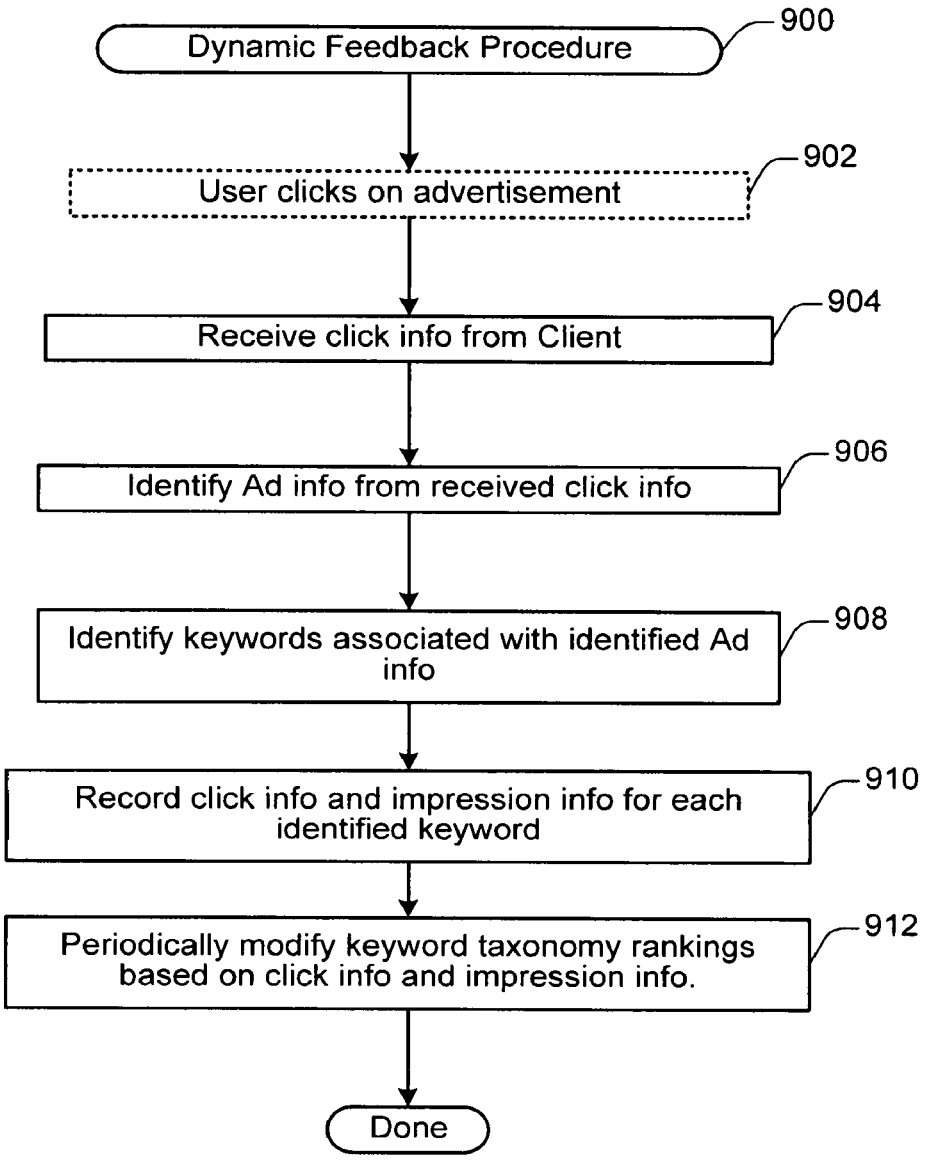

Dynamic Feedback Procedure
900
User clicks on advertisement
902
Receive click info from Client
904
Identify Ad info from received click info
906
Identify keywords associated with identified Ad info
908
Record click info and impression info for each identified keyword
910
Periodically modify keyword taxonomy rankings based on click info and impression info.
912
Done

Fig. 9

Fig. 10A

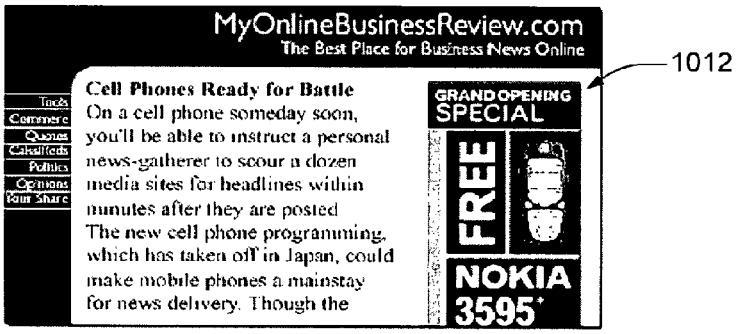


Fig. 10B

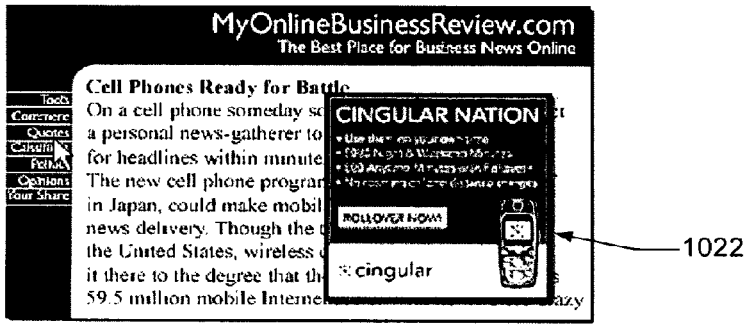


Fig. 10C

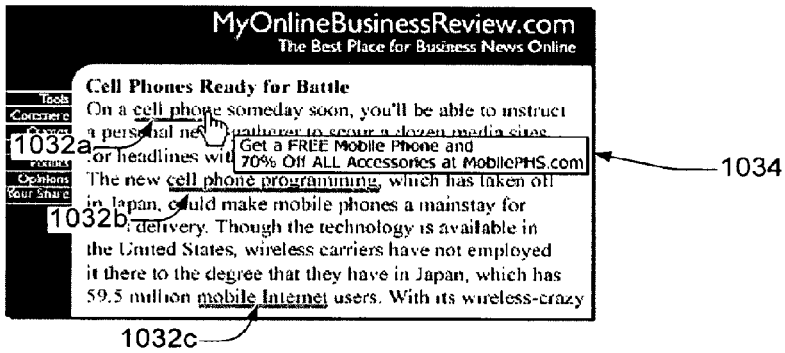


Fig. 10D

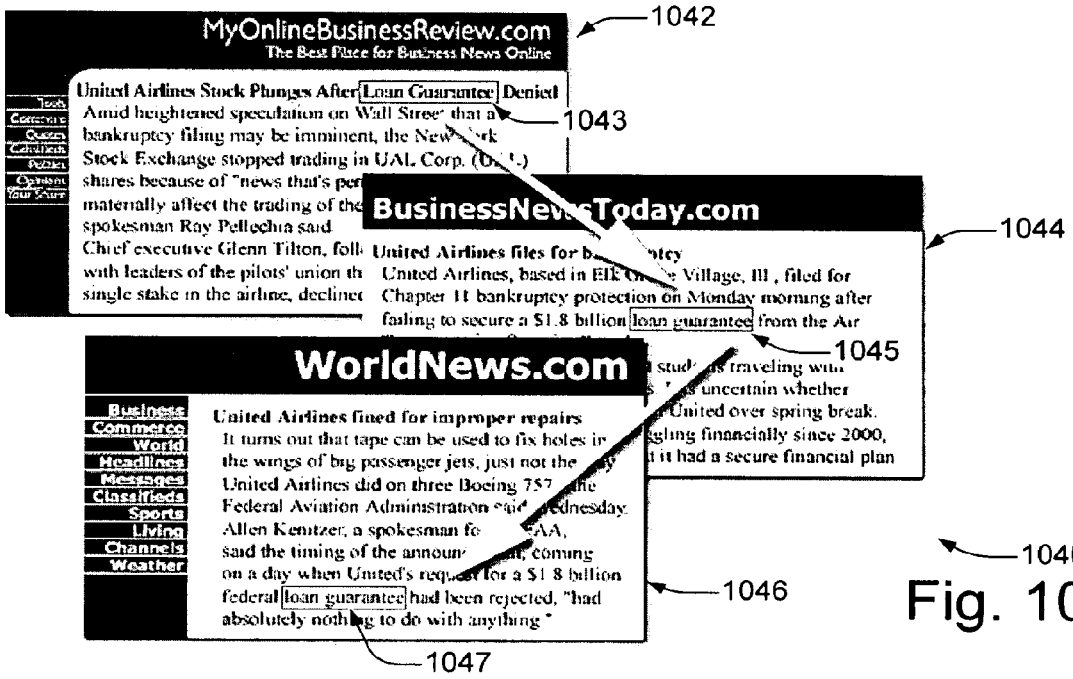

MyOnlineBusinessReview.com
The Best Place for Business News Online
United Airlines Stock Plunges After Loan Guarantee Denied
Amid heightened speculation on Wall Street that a
bankruptcy filing may be imminent, the New York
Stock Exchange stopped trading in UAL Corp.
shares because of "news that's per
materially affect the trading of the
spokesman Ray Pellechia said
Chief executive Glenn Tilton, foll
with leaders of the pilots' union th
single stake in the airline, declinec
BusinessNewsToday.com
United Airlines files for b
United Airlines, based in Elk
Village, Ill., filed for
Chapter 11 bankruptcy protection on Monday morning after
failing to secure a $1.8 billion loan guarantee from the Air
WorldNews.com
Business
Commerce
World
Headlines
Messages
Classifieds
Sports
Living
Channels
Weather
United Airlines fined for improper repairs
It turns out that tape can be used to fix holes in
the wings of big passenger jets, just not the
United Airlines did on three Boeing 757
Federal Aviation Administration said Wednesday.
Allen Kenitzer, a spokesman fo AA,
said the timing of the announ coming
on a day when United's requ for a $1.8 billion
federal loan guarantee had been rejected, "had
absolutely noth g to do with anything
1042
1043
1044
1045
1046
1047
1040

Fig. 10E

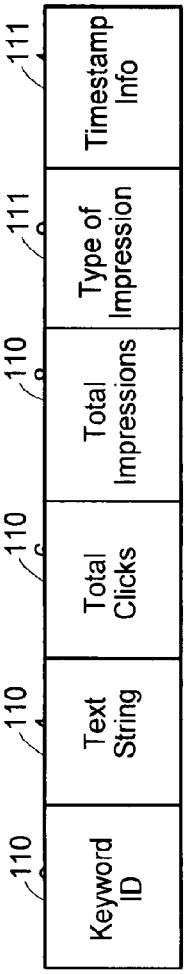


Fig. 11

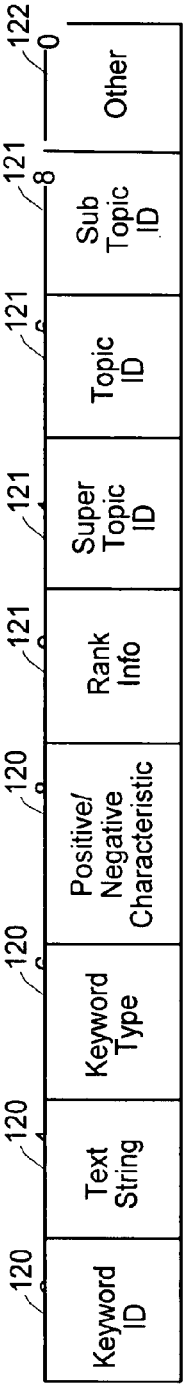


Fig. 12

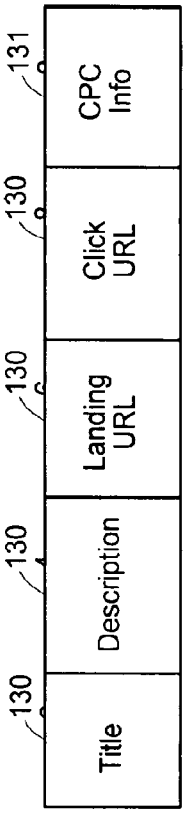


Fig. 13

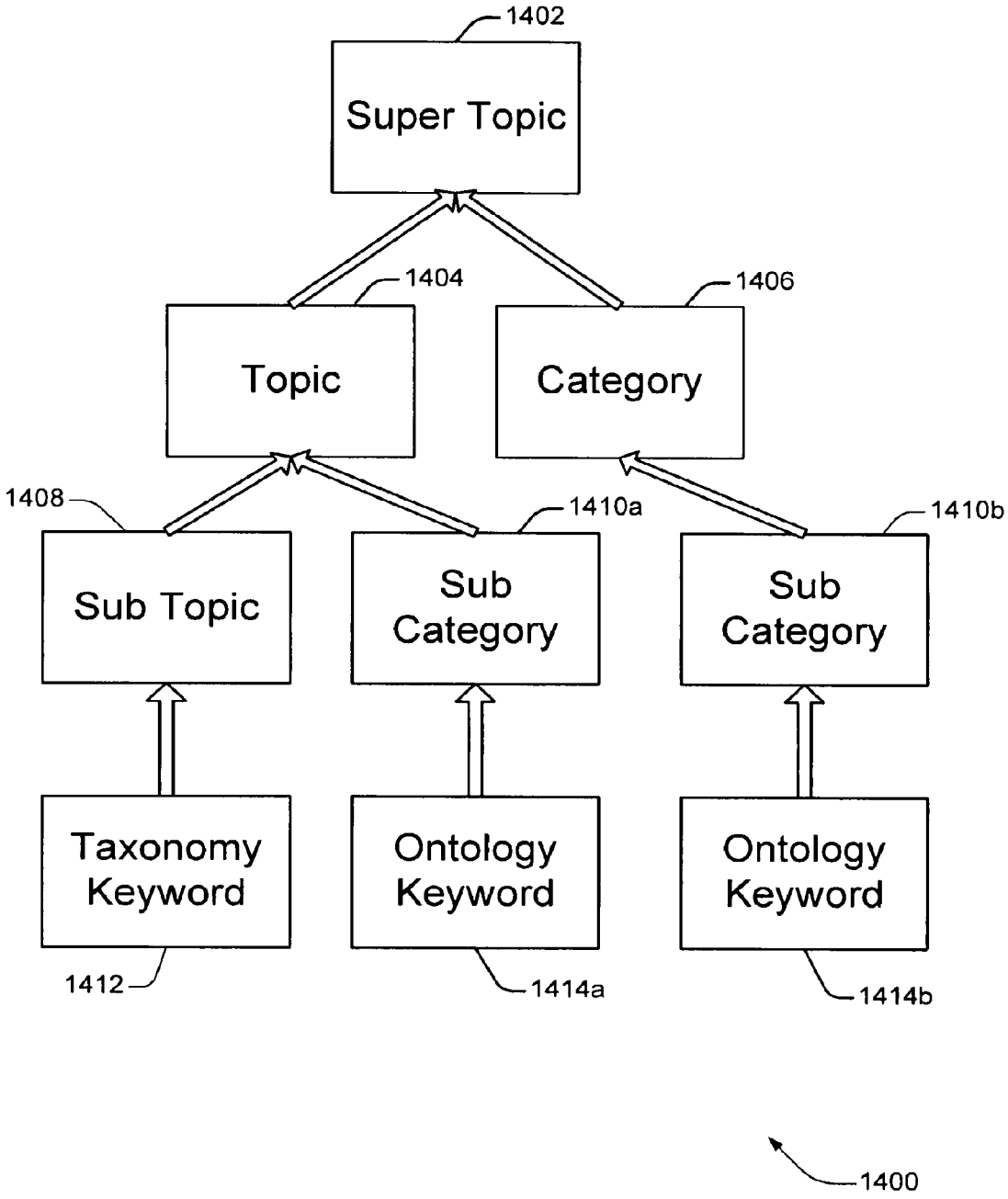

1402
Super Topic
1404
1406
Topic
Category
1408
1410a
1410b
Sub Topic
Sub Category
Sub Category
Taxonomy Keyword
Ontology Keyword
Ontology Keyword
1412
1414a
1414b
1400

Fig. 14

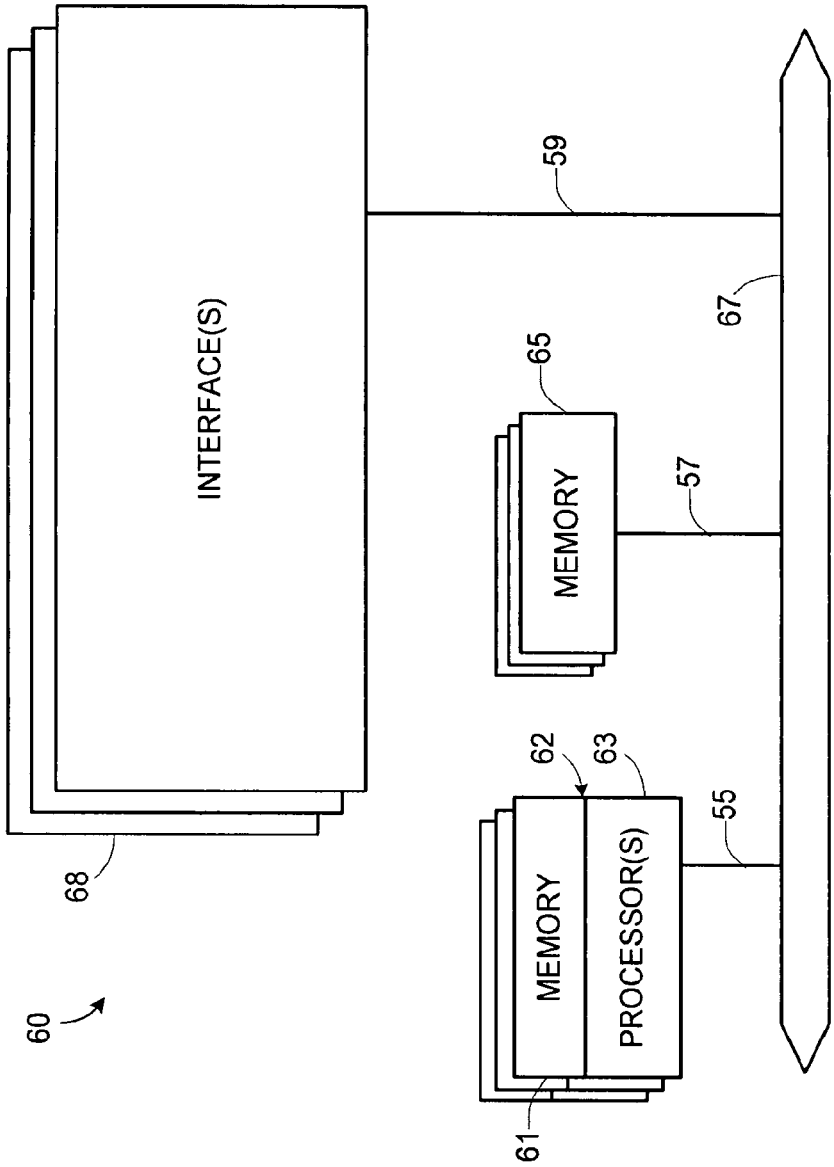

INTERFACE(S)
MEMORY
MEMORY
PROCESSOR(S)
59
67
65
57
62
63
55
68
60
61

Figure 15

SYSTEM AND METHOD FOR REAL-TIME WEB PAGE CONTEXT ANALYSIS FOR THE REAL-TIME INSERTION OF TEXTUAL MARKUP OBJECTS AND DYNAMIC CONTENT

RELATED APPLICATION DATA

This application is a continuation of, and claims priority under 35 U.S.C. §120 to U.S. patent application Ser. No. 11/891,436, filed Aug. 10, 2007, entitled "SYSTEM AND METHOD FOR REAL-TIME WEB PAGE CONTEXT ANALYSIS FOR THE REAL-TIME INSERTION OF TEXTUAL MARKUP OBJECTS AND DYNAMIC CONTENT," which claims priority benefit under 35 U.S.C. §120 to prior U.S. patent application Ser. No. 10/977,352 entitled "SYSTEM AND METHOD FOR REAL-TIME WEB PAGE CONTEXT ANALYSIS FOR THE REAL-TIME INSERTION OF TEXTUAL MARKUP OBJECTS AND DYNAMIC CONTENT," by Henkin et al., filed on Oct. 28, 2004, which claims benefit under 35 U.S.C. §119 to U.S. Provisional Application Ser. No. 60/515,627, naming Henkin et al. as inventors, and filed Oct. 29, 2003. Each of these applications is incorporated herein by reference in its entirety for all purposes.

U.S. patent application Ser. No. 11/891,436, filed Aug. 10, 2007, entitled "SYSTEM AND METHOD FOR REAL-TIME WEB PAGE CONTEXT ANALYSIS FOR THE REAL-TIME INSERTION OF TEXTUAL MARKUP OBJECTS AND DYNAMIC CONTENT," is also a continuation-in-part application of, and claims priority under 35 U.S.C. §120 to U.S. application Ser. No. 09/943,524, "DYNAMIC DOCUMENT CONTEXT MARK-UP TECHNIQUE IMPLEMENTED OVER A COMPUTER NETWORK", naming Henkin et al. as inventors, and filed Aug. 29, 2001, which claims benefit under 35 U.S.C. §119 to U.S. Provisional Application Ser. No. 60/311,418, "METHOD AND SYSTEM FOR ON-LINE BUSINESSES, INCLUDING BUT NOT LIMITED TO INTERNET SERVICE PROVIDERS TO ANALYZE PAGE CONTEXT ALL OVER THE WEB ON REAL TIME AND IN REAL TIME MARK-UP TEXTUAL OBJECTS ON THE PAGE AND DELIVER DYNAMIC OFFERS IN REAL TIME", naming Henkin et al. as inventors, and filed Aug. 9, 2001, and which claims benefit under 35 U.S.C. §119 to U.S. Provisional Application Ser. No. 60/229,452, "METHOD AND SYSTEM FOR ON-LINE BUSINESSES, INCLUDING BUT NOT LIMITED TO INTERNET SERVICE PROVIDERS TO ANALYZE PAGE CONTEXT ALL OVER THE WEB ON REAL TIME AND IN REAL TIME MARK-UP TEXTUAL OBJECTS ON THE PAGE AND DELIVER DYNAMIC OFFERS IN REAL TIME" naming Henkin et al. as inventors, and filed Aug. 30, 2000. Each of these applications is incorporated herein by reference in its entirety for all purposes.

U.S. patent application Ser. No. 11/891,436, filed Aug. 10, 2007, entitled "SYSTEM AND METHOD FOR REAL-TIME WEB PAGE CONTEXT ANALYSIS FOR THE REAL-TIME INSERTION OF TEXTUAL MARKUP OBJECTS AND DYNAMIC CONTENT," is also a continuation-in-part application of, and claims priority under 35 U.S.C. §120 to prior U.S. patent application Ser. No. 09/943,571 entitled "DYNAMIC DOCUMENT CONTEXT MARK-UP TECHNIQUE IMPLEMENTED OVER A COMPUTER NETWORK," the entirety of which is incorporated herein by reference for all purposes.

BACKGROUND OF THE INVENTION

Over the past decade the Internet has rapidly become an important source of information for individuals and businesses. The popularity of the Internet as an information source is due, in part, to the vast amount of available information that can be downloaded by almost anyone having access to a computer and a modem. Moreover, the internet is especially conducive to conduct electronic commerce, and has already proven to provide substantial benefits to both businesses and consumers.

Many web services have been developed through which vendors can advertise and sell products directly to potential clients who access their websites. To attract potential consumers to their websites, however, like any other business, requires target advertising. One of the most common and conventional advertising techniques applied on the Internet is to provide advertising promotions (e.g., banner ads, pop-ups, ad links) on the web page of another website which directs the end user to the advertiser's site when the advertising promotion is selected by the end user. Typically, the advertiser selects websites which provide context or services related to the advertiser's business.

Conventionally, the process of adding contextual advertising promotions to web page content is both resource intensive and time intensive. In recent years the process has been somewhat automated by utilizing software applications such as application servers, ad servers, code editors, etc. Despite such advances, however, the fact remains that conventional contextual advertising techniques typically require substantial investments in qualified personnel, software applications, hardware, and time.

Furthermore, conventional on-line marketing and advertising techniques are often limited in their ability to provide contextually relevant material for different types of web pages. One reason for this is due to the fact that conventional on-line advertising techniques typically rely upon non-real time analysis of web page content (e.g., from cashed versions of static web pages) to make determinations as to which advertising promotions will be contextually relevant to each web page. However, user customizable web pages, password protected web pages, and real-time dynamically generated web pages are examples of other types of web pages for which it is difficult or impossible to access or predict the content of such pages. The problem intensifies when dealing with sites in which the web page content is continuously changing over time such as, for example, news sites.

Accordingly, it will be appreciated that there exists a need for improving on-line contextual advertising techniques in order to utilize real-time analysis of web page content for identifying advertising promotions that are contextually relevant to such content.

SUMMARY OF THE INVENTION

Various aspects of the present invention are directed to methods, systems, and computer program products for delivering contextual information to end users of a data network which includes at least one client system associated with an end user. A portion of web page content relating to a web page intended for display on the client system is received. According to a specific embodiment, the web page may be associated with a URL which is associated with a content provider. The portion of web page content is analyzed for keyword information. A portion of keyword information associated with the portion of web page content is identified. According to a specific embodiment, the portion of keyword information includes at least one keyword. Contextual information to be delivered to the end user is selected using the portion of keyword information. According to a specific embodiment, the contextual information may include ad information which

is provided by a campaign provider server system. A set of web page modification instructions may be generated using the contextual information. According to a specific embodiment, the set of web page modification instructions may include instructions for modifying the web page content to include the selected contextual information. The set of web page modification instructions may be provided to the client system to thereby cause the portion of contextual information to be delivered to the user. According to a specific embodiment, when the client system implements the web page modification instructions, the web page content may be caused to be modified in a manner which results in a display of contextual information on the client system. According to a specific embodiment, the portion of web page content may be analyzed for dynamic keyword information based on language, grammar and/or part-of-speech rules. Keywords relating to the portion of web page content may then be automatically and dynamically generated based upon the dynamic keyword information analysis.

Additional objects, features and advantages of the various aspects of the present invention will become apparent from the following description of its preferred embodiments, which description should be taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows a block diagram of a computer network portion **100** which may be used for implementing various aspects of the present invention in accordance with a specific embodiment.

FIG. **2** shows a block diagram of various components and systems of the Kontera Server System **200** which may be used for implementing various aspects of the present invention in accordance with a specific embodiment.

FIG. **3** shows a flow diagram illustrating various information flows and processes of the present invention which may occur at various systems in accordance with a specific embodiment.

FIG. **4** shows a flow diagram of an alternate embodiment for implementing the contextual analysis and content modification techniques of the present invention.

FIG. **5** shows a flow diagram of a Web Page Content Analysis Procedure **500** and accordance with a specific embodiment of the present invention.

FIG. **6** shows a flow diagram of a Database Method Analysis Procedure **600** in accordance with a specific embodiment of the present invention.

FIG. **7** shows a flow diagram of a Dynamic Method Analysis Procedure **700** in accordance with a specific embodiment of the present invention.

FIG. **8** shows a flow diagram of a Page Modification Instruction Procedure **800** in accordance with a specific embodiment of the present invention.

FIG. **9** shows a flow diagram of a Dynamic Feedback Procedure **900** in accordance with the specific embodiment of the present invention.

FIGS. **10**A-E provide examples of various screen shots which illustrate different techniques which may be used for modifying web page displays in order to present additional contextual advertising information.

FIG. **11** shows an example of a dynamic feedback database record **1100** in accordance with a specific embodiment of the present invention.

FIG. **12** shows an example of a keyword taxonomy database record **1200** in accordance with a specific embodiment of the present invention.

FIG. **13** shows an example of a contextual ad information record **1300** in accordance with a specific embodiment of the present invention.

FIG. **14** shows an example of a keyword/topic classification scheme **1400** in accordance with a specific embodiment of the present invention.

FIG. **15** shows a network device **60** suitable for implementing the contextual information delivery techniques of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention relates to a technique for real-time web page context analysis and real-time insertion of textual markup objects and dynamic content. According to a specific embodiment, the technique of the present invention may be used for enabling advertisers to provide contextual advertising promotions to end-users based upon real-time analysis of web page content that is being served to the end-user's computer system. In at least one embodiment, the information obtained from the real-time analysis may be used to select, in real-time, contextually relevant information, advertisements, and/or other content which may then be displayed to the end-user, for example, via real-time insertion of textual markup objects and/or dynamic content.

According to different embodiment of the present invention, a variety of different techniques may be used for displaying the textual markup information and/or dynamic content information to the end-user. As described in greater detail below, such techniques may include, for example, placing additional links to information (e.g., content, marketing opportunities, promotions, graphics, commerce opportunities, etc.) within the existing text of the web page content by transforming existing text into hyperlinks (herein referred to as "AdLinks"); placing additional relevant search listings or search ads next to the relevant web page content (herein referred to as "TextMatch"); placing relevant marketing opportunities, promotions, graphics, commerce opportunities, etc. next to the web page content (herein referred to as "AdMatch"); placing relevant content, marketing opportunities, promotions, graphics, commerce opportunities, etc. on top or under the current page (herein referred to as "Contextual Pop-ups"); finding pages that relate to each other (e.g., by relevant topic or theme), then finding relevant keywords on those pages, and then transforming those relevant keywords into hyperlinks that link between the related pages (herein referred to as "NaviLinks").

FIG. **1** shows a block diagram of a computer network portion **100** which may be used for implementing various aspects of the present invention in accordance with a specific embodiment. As illustrated in FIG. **1**, network portion **100** includes at least one client system **102**, at least one host server or content provider (CP) server **104**, at least one advertiser system **106**, and at least one contextual analysis and response server (herein referred to as "Kontera Server System" or "KON Server") **108**. It at least one embodiment, the Kontera Server System **108** may be configured or designed to implement various aspects of the present invention including, for example, real-time web page context analysis and/or real-time insertion of textual markup objects and dynamic content. In the example of FIG. **1**, the Kontera Server System **108** is shown to include a variety of components, including, for example, a Cache & Front End component **108***a*, an Analysis & Reaction Engine **108***b*, a Redirect & Tracking Engine **108***c*, a Middle Tier component **108***d*, a database **108***e*, a Taxonomy component **108***f*, a Management Console **108***g*, etc. A number

of these components are described in greater detail with respect to FIG. **2** of the drawings.

FIG. **2** shows a block diagram of various components and systems of the Kontera Server System **200** which may be used for implementing various aspects of the present invention in accordance with a specific embodiment. As illustrated in the embodiment of FIG. **2**, the Front End component **204** includes at least one web server and web server extensions, and is configured or designed to handle requests from client systems **202**.

The Analysis Engine **206** may be configured or designed to perform real-time analysis of web page content. As illustrated in the example of FIG. **2**, the Analysis Engine **206** may include one or more of the following components: a keywords finder **206***a* for identifying keywords on selected web pages; a concepts extractor **206***b* for combining or linking keywords into groups or concepts; a topic finder **206***c* for identifying topics of a web page based on the identified keywords; an aliases finder **206***d* for identifying aliases for topics associated with selected web pages; etc.

The Reaction Engine **208** may be configured or designed to utilize information provided by the Analysis Engine **206** to generate real-time web page modification instructions to be implemented by the client system when rendering web page information. According to a specific embodiment, the web page modification instructions may include instructions relating to the insertion of textual markup objects and/or dynamic content for selected web pages being displayed on the client system. As illustrated in the example of FIG. **2**, the Reaction Engine **208** may include one or more of the following components: an intrasite links finder **208***a* for identifying links between web pages of the same web site and/or between web pages from different web sites; a filter **208***b* for filtering advertisements based upon predetermined criteria (such as, for example, publisher preferences); a cache **208***c* for storing information relating to previous analysis of web pages; a personalization engine **208***d* for selecting or determining recommended web page modification instructions based upon selected user profile information (e.g., user click behavior, Geolocation, etc.).

The Tracking Engine **228** may be configured or designed to include redirect and tracking functionality. For example, the shown in FIG. **2**, the Tracking Engine **228** may include: a redirect component **228***a* for redirecting clients to a specified destination, the tracking component **228***b* for tracking and storing information relating to user clicks and impressions.

Other components of the Kontera Server System **200** may include: a chunk parser **212** (such as, for example, a part-of-speech text processor) for parsing chunks of received web page content and/or for performing analyses of the text syntax; a Middle Tier component **210** configured or designed to include data warehouse and business logic functionality; at least one database **230** for storing information such as, for example, web page analysis information, application data, reports, taxonomy information, ontology information, etc.; a report manager **222** for collecting and storing reports and other information from different components in the Kontera Server System; a connectors component **216** configured or designed to provide a connection point for external data; a translation engine **224** for translating or converting communications from one format type to another format type (e.g., from XML to HTML or vice versa); a parsing engine for parsing HTML into readable text; and a management console **214** which provides a user interface for creating and viewing reports, setting system configurations and parameters, etc. According to a specific embodiment, the management console **214** may be configured or designed to allow content providers and/or advertisers to access the Kontera Server System in order to: access desired information stored at the Kontera Server System (e.g., keyword taxonomy information, content provider information, advertiser information, etc.); manage and generate desired reports; manage information relating to one or more ad campaigns; etc. It will be appreciated that alternate embodiments of the Kontera Server System of the present invention may include additional or fewer components than those illustrated in FIG. **2**.

FIG. **3** shows a flow diagram illustrating various information flows and processes of the present invention which may occur at various systems in accordance with a specific embodiment. According to a specific implementation, in order for a content provider (such as, for example, on-line publishers or other website operators providing on-line content) to utilize the real-time contextual advertising features of the present invention, the content provider will first obtain a unique content provider ID. In one implementation, the unique content provider ID may be assigned by the Kontera Server System. In a specific embodiment, the unique content provider ID information may be embedded into a dynamic context tag (such as, for example, a Java script tag) which may then be inserted into the content provider's web pages. Thus, for example, as illustrated in FIG. **3**, the Kontera Server System (KON) **304** provides (**2**) dynamic context tag information which includes the unique content provider ID to the content provider server (CP) **306**. In at least one implementation, the content provider may utilize the dynamic context tag information to generate one or more dynamic context tags to be inserted (**4**) on selected web pages which the content provider has identified for utilizing the real-time contextual advertising features of the present invention. According to a specific embodiment, each dynamic context tag may include information relating to the content provider ID, and may also include information relating to one or more desire to add types (e.g., TextMatch, AdMatch, Pop-up, AdLink, NaviLink, etc.) for the corresponding web page. In one embodiment, the dynamic context tag may be physically inserted into each of the selected web pages. Alternatively, the dynamic context tag information may be inserted into the page via a tag that is already all the page such as, for example, and ad server tag or an application server tag. Once present on the page, the dynamic context tag will be served as part of the page that is served from the content provider's web server(s).

For example, as shown in FIG. **3**, it is assumed at (**6**) that a user at the client system **302** has initiated a URL request to view a particular web page such as, for example, www.yahoo.com. Such a request may be initiated, for example, via the Internet using an Internet browser application at the client system. When the URL request is received at the content provider server **306**, the server responds by transmitting or serving (**8**) web page content, including the dynamic context tag, to the client system **302**. The client system will then process (**10**) the received web page content including the dynamic context tag, which includes dynamic context tag information relating to the content provider ID and desired ad types for the retrieved web page. According to a specific embodiment, the processing of the dynamic context tag information will invoke a Java script operation which causes the client system to generate (**10**) a unique page key ID for the received web page content, and to transmit (**12**) the page key ID information, desired ad type information, and content provider ID information to the Kontera Server System **304**. In at least one embodiment, a page key ID represents a unique identifier for a specific web page, and may be generated based upon text, structure and/or other content of that web page. In a specific implementation, the page key ID is not based upon

the identity of the user, client system, or content provider. However, the page key ID may be used to uniquely identify personalized web pages, customized web pages, and dynamically generated web pages.

Upon receiving the page key ID information and content provider ID information, the Kontera Server System uses this information to determine (**16**) whether a cached version of the web page corresponding to the page key ID already exists within the Kontera Server System cache. According to a specific embodiment, if it is determined that a cached version of the web page exists at the Kontera Server System, then flow may commence starting at operation (**24**) of FIG. **3**, which is described in greater detail below. However, for purposes of illustration, it is assumed that a cached version of the web page does not exist at the Kontera Server System. Accordingly, the Kontera Server System request (**18**) the client system to provide at least a portion of the web page content. The client system responds by transmitting (**20**) the requested web page content to the Kontera Server System. In the specific implementation, the requested content may be transmitted to the Kontera Server System in chunks which may span the one or more sessions.

As the Kontera Server System receives the web page content from the client system, it analyzes (**22**), in real-time, the received web page content in order to generate keyword information and page topic information. Specific embodiments of the web page content analysis procedure are described in greater detail below with reference to FIGS. **5-7** of the drawings. According to a specific implementation, the keyword information may include, for example, taxonomy keywords, ontology (or "Adlink") keywords, keyword ranking information, primary keyword information, etc. The page topic information may include one or more page topics associated with the web page currently being analyzed. In at least one embodiment, taxonomy keywords may correspond to words or phrases in the web page content which relate to the topic or subject matter of the web page. Ontology or Adlink keywords may correspond to words or phrases in the web page content which may have advertising value. In some cases, it is possible for a word or phrase to be classified as both a taxonomy keyword and an Adlink keyword.

In at least one implementation, the Kontera Server System may continue to request and analyze web page content for the specified web page until it has generated a sufficient amount of keyword information (e.g., 5 or more taxonomy keywords and 5 or more ontology keywords), until it has generated a sufficient amount of page topic information, and/or until the entirety of the web page content has been analyzed. Once the Kontera Server System has finished performing its analysis of the web page content, it may then submit a request (**24**) to one or more advertiser systems **308** for contextual ad information relating to the identified keyword information and page topic information. Each advertiser system may, in turn, process the ad information request in order to determine if it has relevant advertising information relating to the specified keyword information and page topic information. If so, the advertiser system **308** may transmit (**26**) contextual ad information to the Kontera Server System. In at least one embodiment, the contextual ad information may include a variety of different information such as, for example, text, images, HTML, scripts, video, audio, proprietary rich media, etc. In addition, the contextual ad information also include URL information and financial information such as, for example, cost per click (CPC) information. An example of this is illustrated in FIG. **13** of the drawings.

FIG. **13** shows an example of a contextual ad information record **1300** in accordance with a specific embodiment of the present invention. As shown in FIG. **13**, ad information record **1300** may include a plurality of different fields such as, for example, a title field **1302** which may include title information relating to the ad, a description field **1304** which may include content relating to the ad, a click URL field **1308** which includes a "click" URL that is to be accessed when the user clicks on the ad, a landing URL field **1306** which includes a "landing" URL where the user will eventually be redirected to after the click URL action has been processed, a cost-per-click (CPC) information field **1312** which may include cost-per-click information relating to one or more monetary values which the advertiser will pay for each user click on the ad.

According to a specific embodiment, it is possible for the Kontera Server System **304** to receive different contextual ad information from a plurality of different advertiser systems. In one implementation, the received ad information may be sorted and/or ranked according to predetermined criteria (such as, for example, CPC criteria, revenue criteria, expected return criteria, type of ad, likelihood of user clicks, statistical historical data, etc.) in order to select the desired ad to be used.

Returning to FIG. **3**, once a desired ad has been selected, the Kontera Server System may then generate (**28**) web page modification instructions using, for example, the contextual ad information associated with the selected ad, and the desired ad type information specified by the content provider. An example of a specific embodiment of web page modification instructions procedure is described in greater detail below with respect to FIG. **8** of the drawings. According to a specific embodiment, the web page modification instructions may include keyword impression information which may be logged at the Kontera Server System database.

Once the web page modification instructions have been generated, they are transmitted (**30**) to the client system. In a specific embodiment, the web page modification instructions may be implemented using a scripting language such as, for example, Java script. When the web page modification instructions are received at the client system, the client system processes the instructions, and in response, modifies (**32**) the display of the web page content in accordance with the page modification instructions.

According to at least one embodiment, the web page modification instructions may include instructions for modifying, in real-time, the display of web page content on the client system by inserting and/or modifying textual markup information and/or dynamic content information. Because the web page modification operations are implemented automatically, in real-time, and without significant delay, such modifications may be performed transparently to the user. Thus, for example, using the technique of the present invention, when the user submits a URL request at the client system to view a web page (such www.yahoo.com, for example), the client system will receive web page content from www.yahoo.com, and will also receive web page modification instructions from the Kontera Server System. The client system will then render the web page content to be displayed in accordance with the received web page modification instructions.

FIGS. **10**A-E provide examples of various screen shots which illustrate different techniques which may be used for modifying web page displays in order to present additional contextual advertising information. FIG. **10**A illustrates a technique (herein referred to as "TextMatch") for placing additional relevant search listings (**1002***a*, **1002***b*) or search results next to the relevant web page content. FIG. **10**B illustrates a technique (herein referred to as "AdMatch") for placing relevant marketing opportunities, promotions, graphics, commerce opportunities, ads (**1012**), etc. next to the web page

content. FIG. **10**C illustrates a technique (herein referred to as "Contextual Pop-ups") for placing relevant pop-up windows (**1022**) on top or under the current page. The pop-up window(s) may include information relating to content, marketing opportunities, promotions, graphics, commerce opportunities, etc. FIG. **10**D illustrates a technique (herein referred to as "AdLinks") for placing additional links to information (**1034**) (e.g., content, marketing opportunities, promotions, graphics, commerce opportunities, etc.) within the existing text of the web page content by transforming existing text (**1032***a*, **1032***b*) into hyperlinks. FIG. **10**E illustrates a technique (herein referred to as "NaviLinks") for finding web pages (**1042**, **1044**, **1046**) that relate to each other (e.g., by relevant topic or theme), finding relevant keywords (**1043**, **1045**, **1047**) on those pages, and then transforming those relevant keywords into hyperlinks that link between the related pages.

Returning to FIG. **3**, at (**34**) it is assumed that the user has clicked on one of the contextual ads which was dynamically inserted into the web page content using the above-described technique. According to at least one embodiment, the action of the user clicking on one of the contextual ads causes the client system to transmit (**36**) a URL request to the Kontera Server System. The URL request may be logged (**38**) in a local database at the Kontera Server System when received. The URL may include embedded information allowing the Kontera Server System to identify various information about the selected ad, including, for example, the identity of the sponsoring advertiser, the keywords(s) associated with the ad, the ad type, etc. The Kontera Server System **304** may use at least a portion of this information to generate (**38**) redirected instructions for redirecting the client system to the identified advertiser. Additionally, the Kontera Server System may also use at least a portion of the URL information during execution (**40**) of a Dynamic Feedback Procedure such as that illustrated, for example, in FIG. **9** of the drawings. In at least one embodiment, the Dynamic Feedback Procedure may be implemented to record user click information and impression information associated with various keywords.

As shown at (**42**), the Kontera Server System transmits the redirected instructions to the client system **302**. In response, the client system is redirected to transmit (**44**) a new URL request to Ad Server **308**. The Ad Server may then respond by serving (**46**) web page content corresponding to the URL request to the client system **302**. In at least one embodiment, the web page content sent from the ad Server **308** may include text or other information relevant to content of the web page previously displayed to the user.

FIG. **4** shows a flow diagram of an alternate embodiment for implementing the contextual analysis and content modification techniques of the present invention. As explained in greater detail below, the contextual analysis and content modification techniques of FIG. **4** may be implemented without the need for the content provider to modify its web pages to include dynamic context tag information such as that described previously with respect to FIG. **3**.

In the example of FIG. **4**, it is assumed at (**1**) that a user at the client system **402** has initiated a URL request to view a particular web page such as, for example, www.yahoo.com. Such a request may be initiated, for example, via the Internet using an Internet browser application at the client system. When the URL request is received at the content provider server **406**, server **406** responds by transmitting (**3**) the URL request info and/or web page content (corresponding to the requested URL) to the Kontera Server System **404**. In a specific embodiment where the Kontera Server System receives only the URL request information from the content provider server, the Kontera Server System may request (**5**) the web page content (corresponding to the requested URL) from the content provider server **406**. The server **406** made and respondent by providing the requested web page content to the Kontera Server System.

As the Kontera Server System **404** receives the web page content from the content provider server **406**, it analyzes (**9**), in real-time, the received web page content in order to generate keyword information and page topic information. In at least one implementation, the Kontera Server System may continue to request and analyze web page content for the specified web page until it has generated a sufficient amount of keyword information until it has generated a sufficient amount of page topic information, and/or until the entirety of the web page content has been analyzed. Once the Kontera Server System has finished performing its analysis of the web page content, it may then submit a request (**11**) to one or more advertiser systems **408** for contextual ad information relating to the identified keyword information and page topic information. Each advertiser system may, in turn, process the ad information request in order to determine if it has relevant advertising information relating to the specified keyword information and page topic information. If so, the advertiser system **408** may transmit (**13**) contextual ad information to the Kontera Server System.

According to a specific embodiment, it is possible for the Kontera Server System **404** to receive different contextual ad information from a plurality of different advertiser systems. In one implementation, the received ad information may be sorted and/or ranked according to predetermined criteria in order to select a desired ad. Once a desired ad has been selected, the Kontera Server System may then generate (**15**) web page modification instructions using, for example, the contextual ad information associated with the selected ad, and desired ad type information specified by the content provider server **406**. The web page content and web page modification instructions are then transmitted (**17**) to the client system. When the web page content and web page modification instructions are received at the client system, the client system processes the instructions, and in response, modifies (**19**) the web page content in accordance with the web page modification instructions. In an alternate embodiment (not shown), the Kontera Server System may perform the task of modifying the web page content in accordance with the web page modification instructions before sending the modified information to the client system **402**. Accordingly, in this embodiment the client system may receive the modified web page content (which now includes the contextual ad information) from the Kontera Server System.

Because the web page modification operations are implemented automatically, in real-time, and without significant delay, such modifications may be performed transparently to the user. Thus, for example, from the user's perspective, when the user requests a particular web page to be retrieved and displayed on the client system, the client system will respondent by displaying a modified web page which not only includes the original web page content, but also includes additional contextual ad information. If the user subsequently clicks on one of the contextual ads which was dynamically inserted into the web page content (a shown, for example, at operation **34** of FIG. **3**), process flow may commence in a manner similar to that described previously with respect to operations (**34**)-(**46**) of FIG. **3**.

FIG. **5** shows a flow diagram of a Web Page Content Analysis Procedure **500** and accordance with a specific embodiment of the present invention. In at least one embodiment, the Web Page Content Analysis Procedure **500** may be imple-

mented at the Kontera Server System for analyzing received web page content in order to generate keyword information and page topic information, as described previously, for example, with respect to FIGS. **3** and **4**. As illustrated in the embodiment of FIG. **5**, when a portion of web page content is presented to the Kontera Server System for analysis, the Kontera Server System may respond by performing (**502**) a database method analysis of the received web page content, and by also performing (**504**) a dynamic method analysis of the received web page content. The results from the database method analysis and dynamic method analysis may then be combined (**506**) in order to generate desired keyword information and page topic information.

FIG. **6** shows a flow diagram of a Database Method Analysis Procedure **600** in accordance with a specific embodiment of the present invention. According to at least one embodiment, the Database Method Analysis Procedure **600** may be implemented during execution of the Web Page Content Analysis Procedure **500** of FIG. **5**. In a specific implementation, the Database Method Analysis Procedure may be configured to utilize taxonomy keyword information when analyzing web page content in order to identify taxonomy keywords and/or ontology keywords. The Database Method Analysis Procedure may also be configured to utilize the identified keyword information in order to generate other information such as, for example, primary keyword information, topic information (e.g., which relates to the topic of the web page content), etc. An example of the keyword/topic classification scheme as illustrated in FIG. **14** of the drawings.

FIG. **14** shows an example of a keyword/topic classification scheme **1400** in accordance with a specific embodiment of the present invention. As illustrated in the example of FIG. **14**, the keyword/topic classification scheme may include a plurality of hierarchical classifications (e.g., keywords, subtopics, subcategories, topics, categories, super topics, etc.). The highest level of the hierarchy corresponds to super topic information **1402**. In one implementation, the super topic may correspond to a general topic or subject matter such as, for example, "sports". The next level in the hierarchy includes topic information **1404** and category information **1406**. In one implementation, topic information may correspond to subsets of the super topic which may be appropriate for contextual content analysis. For example, "basketball" is an example of a topic of the super topic "sports". Category information, on the other hand, may correspond to subsets of the super topic which may be appropriate for advertising purposes, but which may not be appropriate for contextual content analysis. For example, "sports equipment" is an example of a category of the super topic "sports".

The next level in the hierarchy includes sub-topic information **1408** and sub-category information **1410***a*, **1410***b*. In one implementation, sub-topic information may correspond to subsets of topics which may be appropriate for contextual content analysis. For example, "NBA" is an example of a sub-topic associated with the topic "basketball". Sub-category information may correspond to subsets of topics and/or categories which may be appropriate for advertising purposes, but which may not be appropriate for contextual content analysis. For example, "NBA merchandise" is an example of a sub-category of topic "basketball", and "foosball" is an example of a sub-category associated with the category "sports equipment". The lowest level of the hierarchy corresponds to keyword information, which may include taxonomy keywords **1412**, ontology keywords **1414***a*, **1414***b*, and/or keywords which may be classified as both taxonomy and ontology. In at least one embodiment, taxonomy keywords may correspond to words or phrases in the web page content which relate to the topic or subject matter of a web page. Ontology (or "Adlink") keywords may correspond to words or phrases in the web page content which are not to be included in the contextual content analysis but which may have advertising value. For example, "LA Lakers" is an example of a taxonomy keyword of sub-topic "NBA", "Air Jordan" is an example of an ontology keyword associated with the sub-category "NBA merchandise", and "foosball table" is an example of an ontology keyword associated with the sub-category "foosball".

Returning to the example of FIG. **6**, it is assumed that the Database Method Analysis Procedure **600** has been called to analyze a portion of web page content which, for example, has been received at the Kontera Server System. Accordingly, as shown at (**602**), the web page content to be analyzed is accessed. Additionally, as shown at (**604**), keyword taxonomy information is retrieved. In a specific implementation, the keyword taxonomy information may include a keyword taxonomy file which is stored in a database at the Kontera Server System. The keyword taxonomy file may include a plurality of taxonomy keywords and/or ontology keywords. In one implementation, each record in the keyword taxonomy file may use a format similar to that shown, for example, in FIG. **12** of the drawings.

As the Database Method Analysis Procedure performs its analysis, it compares the web page content to information in the keyword taxonomy information in order to identify (**606**) all ontology keywords in the web page content, and to identify (**608**) all taxonomy keywords in the web page content. After identifying the ontology and taxonomy keywords, the Database Method Analysis Procedure ranks (**610**) the identified taxonomy keywords based upon predetermined criteria. According to different implementations, the ranking of an identified taxonomy keyword may be based on a variety of different criteria such as, for example, its location on the web page, its relative location in the keyword taxonomy file, frequency of occurrence on the web page, its formatting properties, its proximity to other words, its previous performance indicators (e.g., clicks/impressions), pricing information, etc. For example, according to a specific implementation, different pricing information (e.g., average price (CPC) per keyword and/or topic) may be associated with different keywords and/or topics. Such pricing information may be used as criteria for ranking various keywords. For example, higher priced keywords may receive a relatively higher ranking score. This feature provides the benefit of facilitating elevation of revenue numbers for server-side clients such as content providers and/or advertisers.

After the identified taxonomy keywords have been ranked, the Database Method Analysis Procedure may then identify (**612**) appropriate sub-topic, topic and/or super topic classifications of the web page content based upon the keyword rankings. Using this information, the Database Method Analysis Procedure may then determine (**614**) the appropriate topic level (e.g., sub-topic, topic, or super topic) of the overall web page content subject matter. In at least one embodiment, it is possible for multiple topics and/or sub-topics to be assigned to a given web page. In this way, each topic and/or sub-topic assigned to the web page may be evaluated independently for performance purposes.

FIG. **7** shows a flow diagram of a Dynamic Method Analysis Procedure **700** in accordance with a specific embodiment of the present invention. According to at least one embodiment, the Dynamic Method Analysis Procedure **700** may be implemented during execution of the Web Page Content Analysis Procedure **500** of FIG. **5**. In a specific implementation, the Dynamic Method Analysis Procedure may be con-

figured to dynamically identify keywords in web page content without relying upon the keyword taxonomy information during the analysis.

In the example of FIG. **7**, it is assumed that the Dynamic Method Analysis Procedure **700** has been called to analyze a portion of web page content which, for example, has been received at the Kontera Server System. Upon receiving (**702**) a chunk or portion of the web of a content, the Dynamic Method Analysis Procedure generates (**704**) a noun list of potential keywords by analyzing the web page content using language and/or grammar rules. In one implementation, the noun list may include nouns, proper nouns, and/or noun phrases which have been identified in the web page content. According to a specific embodiment, such a noun list may be generated, for example, by identifying the parts of speech of the words and/or phrases in the web page content, and then the selecting the identified nouns, proper nouns, and/or noun phrases. According to different embodiments, a variety of different techniques may be used for identifying the parts of speech of the words and/or phrases in the web page content. An example of such a technique is via the use of a part-of-speech processing algorithm such as the NLProcessor Engine, available from Infogistics Ltd. of Edinburgh, Scotland (www.infogistics.com).

After the noun list has been generated, it may be filtered (**706**), for example, by removing restricted or undesirable words. The noun list information may then be grouped (**708**) according to desired criteria such as, for example, by sequences and/or similarities. The different noun groups may then be ranked (**710**) according to desired criteria such as, for example, frequency, length of word, etc. as shown at (**712**) at least a portion of the different noun groups may be selected to be associated as keywords for selected web page. In a specific implementation, the selected noun groups may correspond to those groups which have a corresponding match to keywords in the keyword taxonomy, and also which are associated with the page topic(s) identified for the selected web page. According to a specific implementation, the ranked noun groups may (optionally) be compared (**714**) to the keyword taxonomy information, and then re-ranked based on the comparison. For example, noun groups which have a corresponding match to keywords in the keyword taxonomy may receive an increase in their relative ranked value.

It will be appreciated that one advantage of the Dynamic Method Analysis Procedure is that it may be used to generate a plurality of new and/or additional keywords which are not presently included in the keyword taxonomy database. This feature provides the additional benefit of allowing the use of a smaller keyword taxonomy file to dynamically generate a desired amount of identified keywords during the web page content analysis. It also enables the identification of new products, company names, etc. that were not previously added into the keyword taxonomy database. FIG. **8** shows a flow diagram of a Page Modification Instruction Procedure **800** in accordance with a specific embodiment of the present invention. In at least one embodiment, the Page Modification Instruction Procedure may be implemented at the Kontera Server System for generating web page content modification instructions using contextual ad information, as described previously, for example, with respect to FIGS. **3** and **4**. In the example of FIG. **8**, it is assumed that the Kontera Server System has submitted a request to one or more advertiser systems for contextual ad information relating to specific keyword information and page topic information. It is further assumed that one or more advertiser systems have responded to the request by transmitting their respective ad information to the Kontera Server System. When the ad information is received (**802**) from the advertisers, the ad information may be ranked (**804**) based upon predetermined criteria such as, for example, CPC criteria, revenue criteria, expected return criteria, likelihood of user clicks, statistical historical data, etc. One or more ads may then be selected (**806**) (depending upon the number of ads desired) based upon their relative ranking.

Once the desired ad(s) have been selected, the Page Modification Instruction Procedure may then generate (**808**) web page modification instructions using, for example, the contextual ad information associated with the selected ad, and the desired ad type information specified by the content provider. According to at least one embodiment, the web page modification instructions may include instructions for modifying, in real-time, the display of web page content on the client system by inserting and/or modifying textual markup information and/or dynamic content information. Additionally, the web page modification instructions may include keyword impression information which may be stored at the Kontera Server System database. Once generated, the web page modification instructions may then be transmitted (**810**) to the client system for implementation. In a specific embodiment, the web page modification instructions may be implemented using a scripting language such as, for example, Java script. When the web page modification instructions are received at the client system, the client system processes the instructions, and in response, modifies the display of the web page content in accordance with the page modification instructions.

FIG. **9** shows a flow diagram of a Dynamic Feedback Procedure **900** in accordance with the specific embodiment of the present invention. In at least one embodiment, the Dynamic Feedback Procedure may be implemented at the Kontera Server System to record user click information and impression information associated with various keywords, as described previously, for example, with respect to FIG. **3**. In the example of FIG. **9**, it is assumed that (**902**) that the user has click on a contextual advertisement displayed on the client system. The action of the user clicking on one of the contextual ads causes the client system to transmit the user click information to the Kontera Server System by way of a URL request. The URL request may include embedded information allowing the Kontera Server System to identify various information about the ad, including, for example, the identity of the sponsoring advertiser, the keywords(s) associated with the ad, the ad type, etc. When the Dynamic Feedback Procedure receives (**904**) the click information, it identifies (**906**) the ad information associated with the click information, and identifies (**908**) the keywords associated with the identified ad information. The user click information and impression information for each of the identified keywords may then be recorded (**910**). In one implementation, the user click information and impression information is recorded on a local database at the Kontera Server System. Additionally, in at least one implementation, information relating to the keyword impression information may be accessed from a database at the Kontera Server System. As shown at (**912**) the rankings of keywords in the keyword taxonomy database may be periodically modified based upon specific criteria such as, for example, the user click information and impression information associated with each keyword.

FIG. **11** shows an example of a dynamic feedback database record **1100** in accordance with a specific embodiment of the present invention. In at least one embodiment, the Dynamic Feedback Procedure may store user click information and impression information for selected keywords using the dynamic feedback database record **1100**. As illustrated in the

embodiment of FIG. **11**, the dynamic feedback database record may include a plurality of different fields (**1102-1114**) for recording various information about a selected keyword. For example, the dynamic feedback database record may include: a keyword ID field **1102** which includes keyword ID information relating to a selected keyword; a text string field **1104** which includes information relating to the keyword text string; a total clicks field **1106** which includes information relating to a cumulative or total amount of user clicks for that particular keyword (e.g., total clicks for a specific page, total clicks across pages that were part of a specific topic (super topic, topic, sub topic), etc.); a total impressions field **1108** which includes information relating to a cumulative or total amount of impressions for that particular keyword; an impression type field **1112** which includes information relating to the type(s) of impression(s) (e.g., Adlink, pop-up, Navilink, SerchMatch, AdMatch, etc.) used to display that particular keyword; a timestamp information field which includes information relating to the time(s)/date(s) when the user click(s) occurred for that particular keyword, etc.

FIG. **12** shows an example of a keyword taxonomy database record **1200** in accordance with a specific embodiment of the present invention. According to at least one embodiment, the keyword taxonomy database record may include a plurality of different fields (**1202-1220**) for recording various information about a selected keyword. For example, the keyword taxonomy database record may include: a keyword ID field **1202** which includes keyword ID information relating to a selected keyword; a text string field **1204** which includes information relating to the keyword text string; a keyword type field **1206** which includes information relating to the keyword type (e.g., taxonomy, ontology, or both); a rank information field **1212** which includes information relating to relative ranking of that keyword within the keyword taxonomy database; a super topic ID field **1214** which includes information relating to at least one super topic associated with that particular keyword; a topic ID field **1216** which includes information relating to at least one topic (if any) associated with that particular keyword; and a topic ID field **1218** which includes information relating to at least one sub-topic (if any) associated with that particular keyword. The keyword taxonomy database record may also include other fields **1220** which may include other information such as, for example, category information (if any), subcategory information (if any), pricing information (e.g., average CPC price for keyword and/or topic), etc.

It will be appreciated that the present invention provides content providers with an efficient and unique technique of presenting desired information to end users while those users are browsing the content providers' web pages. Moreover, the technique of the present invention enables content providers to proactively respond to the contextual content on any given page that their customers/users are currently viewing. According to at least one implementation, the technique of the present invention allows a content provider to present links, advertising information, and/or other special offers or promotions which that are highly relevant to the user at that point in time, based on the context of the web page the user is currently viewing, and without the need for the user to perform any active action. As described previously, the additional information to be displayed to the user may be delivered using a variety of techniques such as, for example, providing direct links to other pages with relevant information; providing links that open layers with link(s) to relevant information on the page that the user is on; providing links that open layers with link(s) to relevant information on the page that the user is on; providing layers that open automatically once the user reaches a given page, and presenting information that is relevant to the context of the page; providing graphic and/or text promotional offers, etc.; providing links that open layers with content that is served from an external (third party content server) location, etc.

Moreover, it will be appreciated that the technique of the present invention provides a contextual-based platform for delivering to an end user in real-time proactive, personalized, contextual information relating to web page content currently being displayed to the user. In addition, the contextual information delivery technique of the present invention may be implemented using a remote server operation without any need to modify content provider server configurations, and without the need for any conducting any crawling, indexing, and/or searching operations prior to the web page being accessed by the user. Furthermore, because the technique of the present invention is able to deliver additional contextual information to the user based upon real-time analysis of web page content currently being viewed by the user, the contextual information delivery technique of the present invention is compatible for use with static web pages, customized web pages, personalized web pages, dynamically generated, web pages, and even with web pages where the web page content is continuously changing over time (such as, for example, news site web pages).

Additional techniques relating to on-line contextual advertising techniques are described in U.S. patent application Ser. No. 09/943,524, entitled "DYNAMIC DOCUMENT CONTEXT MARK-UP TECHNIQUE IMPLEMENTED OVER A COMPUTER NETWORK", filed on Aug. 29, 2001, naming Henkin et al. as inventors. That application is incorporated herein by reference in its entirety for all purposes.

Other Embodiments

Generally, the contextual information delivery techniques of the present invention may be implemented on software and/or hardware. For example, they can be implemented in an operating system kernel, in a separate user process, in a library package bound into network applications, on a specially constructed machine, or on a network interface card. In a specific embodiment of this invention, the technique of the present invention is implemented in software such as an operating system or in an application running on an operating system.

A software or software/hardware hybrid implementation of the contextual information delivery technique of this invention may be implemented on a general-purpose programmable machine selectively activated or reconfigured by a computer program stored in memory. Such programmable machine may be a network device designed to handle network traffic, such as, for example, a router or a switch. Such network devices may have multiple network interfaces including frame relay and ISDN interfaces, for example. Specific examples of such network devices include routers and switches. A general architecture for some of these machines will appear from the description given below. In an alternative embodiment, the contextual information delivery technique of this invention may be implemented on a general-purpose network host machine such as a personal computer or workstation. Further, the invention may be at least partially implemented on a card (e.g., an interface card) for a network device or a general-purpose computing device.

Referring now to FIG. **15**, a network device **60** suitable for implementing the contextual information delivery techniques of the present invention includes a master central processing unit (CPU) **62**, interfaces **68**, and a bus **67** (e.g., a PCI bus).

When acting under the control of appropriate software or firmware, the CPU **62** may be responsible for implementing specific functions associated with the functions of a desired network device. For example, when configured as a network server, the CPU **62** may be responsible for analyzing packets, encapsulating packets, forwarding packets to appropriate network devices, analyzing web page content, generating web page modification instructions, etc. The CPU **62** preferably accomplishes all these functions under the control of software including an operating system (e.g. Windows NT), and any appropriate applications software.

CPU **62** may include one or more processors **63** such as a processor from the Motorola or Intel family of microprocessors or the MIPS family of microprocessors. In an alternative embodiment, processor **63** is specially designed hardware for controlling the operations of network device **60**. In a specific embodiment, a memory **61** (such as non-volatile RAM and/or ROM) also forms part of CPU **62**. However, there are many different ways in which memory could be coupled to the system. Memory block **61** may be used for a variety of purposes such as, for example, caching and/or storing data, programming instructions, etc.

The interfaces **68** are typically provided as interface cards (sometimes referred to as "line cards"). Generally, they control the sending and receiving of data packets over the network and sometimes support other peripherals used with the network device **60**. Among the interfaces that may be provided are Ethernet interfaces, frame relay interfaces, cable interfaces, DSL interfaces, token ring interfaces, and the like. In addition, various very high-speed interfaces may be provided such as fast Ethernet interfaces, Gigabit Ethernet interfaces, ATM interfaces, HSSI interfaces, POS interfaces, FDDI interfaces and the like. Generally, these interfaces may include ports appropriate for communication with the appropriate media. In some cases, they may also include an independent processor and, in some instances, volatile RAM. The independent processors may control such communications intensive tasks as packet switching, media control and management. By providing separate processors for the communications intensive tasks, these interfaces allow the master microprocessor **62** to efficiently perform routing computations, network diagnostics, security functions, etc.

Although the system shown in FIG. **15** illustrates one specific network device of the present invention, it is by no means the only network device architecture on which the present invention can be implemented. For example, an architecture having a single processor that handles communications as well as routing computations, etc. is often used. Further, other types of interfaces and media could also be used with the network device.

Regardless of network device's configuration, it may employ one or more memories or memory modules (such as, for example, memory block **65**) configured to store data, program instructions for the general-purpose network operations and/or other information relating to the functionality of the contextual information delivery techniques described herein. The program instructions may control the operation of an operating system and/or one or more applications, for example. The memory or memories may also be configured to store data structures, keyword taxonomy information, advertisement information, user click and impression information, and/or other specific non-program information described herein.

Because such information and program instructions may be employed to implement the systems/methods described herein, the present invention relates to machine readable media that include program instructions, state information, etc. for performing various operations described herein. Examples of machine-readable media include, but are not limited to, magnetic media such as hard disks, floppy disks, and magnetic tape; optical media such as CD-ROM disks; magneto-optical media such as floptical disks; and hardware devices that are specially configured to store and perform program instructions, such as read-only memory devices (ROM) and random access memory (RAM). The invention may also be embodied in a carrier wave traveling over an appropriate medium such as airwaves, optical lines, electric lines, etc. Examples of program instructions include both machine code, such as produced by a compiler, and files containing higher level code that may be executed by the computer using an interpreter.

Although several preferred embodiments of this invention have been described in detail herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to these precise embodiments, and that various changes and modifications may be effected therein by one skilled in the art without departing from the scope of spirit of the invention as defined in the appended claims.

The invention claimed is:

1. A computer-implemented method of analyzing a web page that comprises universal resource locator (URL) information that identifies the web page and other content, the method comprising:

at a server, receiving from a client system one or more portions of the other content of the web page;

analyzing the other content received from the client system to generate keyword information by comparing the other content of the web page with information in a keyword taxonomy, generating keywords that are not presently included in a keyword taxonomy database, and adding the newly generated keywords to the keyword taxonomy database;

communicating a request to an advertisement server for advertisement information relating to the keyword information;

receiving from the advertisement server the advertisement information;

ranking the advertisement information based, at least in part, on ranking advertisements based on information indicating a likelihood of a user clicking on the advertisements;

selecting an advertisement to be inserted into the web page based, at least in part, on the ranking;

generating web page modification instructions that, when processed at the client system, modify how the web page is displayed on the client system; and

communicating the web page modification instructions to the client system, wherein the web page modification instructions, when processed by the client system:

insert the advertisement into the web page; and

cause a URL request to be transmitted to the server based on detecting an action that includes a click event, wherein the URL request includes embedded information enabling the server to identify various information about an advertisement selected, via the click event, by the user of a user of the client system.

2. The computer-implemented method of claim **1**, wherein the web page has been received by the client system from a content provider server.

3. The computer-implemented method of claim **1**, wherein the web page has been received by the client system from a content provider server in response to a URL request from the client system to the content provider server.

4. The computer-implemented method of claim 1, wherein the web page includes a tag that is associated with the server that receives the one or more portions of the other content of the web page from the client system.

5. The computer-implemented method of claim 4, wherein the tag, when processed by the client system, invokes a JavaScript operation.

6. The computer-implemented method of claim 4, wherein the tag, when processed by the client system, invokes a script operation.

7. The computer-implemented method of claim 6, wherein the one or more portions of the other content of the web page are provided to the server by the client system, at least in part, as a result of script operations invoked by the tag.

8. The computer-implemented method of claim 4, further comprising receiving, at the server, a unique identifier for the web page, the unique identifier generated by the client system based, at least in part, on text of the web page.

9. The computer-implemented method of claim 8, wherein the unique identifier is generated by the client system as a result of script operations that are invoked by the tag.

10. The computer-implemented method of claim 8, further comprising receiving, at the server, advertisement type information and content provider identification information from the client system.

11. The computer-implemented method of claim 10, wherein the unique identifier, ad type information and content provider identification are provided by the client system, at least in part, as a result of operations invoked by the tag.

12. The computer-implemented method of claim 1, wherein the web page is any one of: a personalized web page, a customized web page, or a dynamically generated web page.

13. The computer-implemented method of claim 1, wherein the keyword information includes keywords from the one or more portions of the other content of the web page.

14. The computer-implemented method of claim 1, wherein the keyword information includes any one or more of: taxonomy keywords, ontology keywords, or keyword ranking information.

15. The computer-implemented method of claim 1, wherein ranking the advertisement information is further based, at least in part, on ranking advertisements based on cost-per-click information associated with the advertisements.

16. The computer-implemented method of claim 1, wherein ranking the advertisement information is further based, at least in part, on ranking advertisements based on revenue information associated with the advertisements.

17. The computer-implemented method of claim 1, wherein ranking the advertisement information is further based, at least in part, on ranking advertisements based on expected return information associated with the advertisements.

18. The computer-implemented method of claim 1, wherein ranking the advertisement information is further based, at least in part, on ranking advertisements based on statistical historical data associated with the advertisements.

19. The computer-implemented method of claim 1, wherein the web page modification instructions, when processed by the client system, also transform text of the web page into a hyperlink.

20. The computer-implemented method of claim 19, wherein the text corresponds to a keyword.

21. The computer-implemented method of claim 19, wherein the web page modification instructions, when processed by the client system, also insert textual markup information into the web page.

22. The computer-implemented method of claim 19, wherein the web page modification instructions, when processed by the client system, also insert dynamic content information.

23. The computer-implemented method of claim 1, wherein the web page modification instructions, when processed by the client system, also transform a keyword in the text of the web page into a hyperlink.

24. The computer-implemented method of claim 1, further comprising receiving a request from the client system based, at least in part, on an action of a user of the client system with respect to an advertisement inserted into the web page content as a result of the client system processing the web page modification instructions.

25. The computer-implemented method of claim 24, further comprising, in response to receiving the request at the server, transmitting redirection instructions to the client system.

26. The computer-implemented method of claim 25, wherein the redirection instructions, when processed by the client system, redirect the client system to a destination associated with the advertisement inserted into the web page.

27. The computer-implemented method of claim 1, wherein the web page modification instructions further include instructions for recording user click information associated with keywords.

28. The computer-implemented method of claim 1, wherein the web page modification instructions further include instructions for recording impression information associated with keywords.

29. The computer-implemented method of claim 1, further comprising determining whether a cached version of the web page exists using the unique identifier.

30. The computer-implemented method of claim 1, further comprising requesting the one or more portions of the other content of the web page from the client system.

31. The computer-implemented method of claim 1, further comprising using the unique identifier to determine that a cached version of the web page does not exist at the server, and requesting the one or more portions of the other content of the web page from the client system.

32. The computer-implemented method of claim 1, further comprising:

analyzing the other content received from the client system to generate topic information for the web page;

wherein communicating the request to the advertisement server for advertisement information includes communicating the topic information for the web page to the advertisement server for advertising information relating to the topic information.

33. The computer-implemented method of claim 1, wherein the one or more portions of the other content of the web page are received by the server in chunks.

34. The computer-implemented method of claim 33, wherein the chunks are received by the server over more than one session.

35. The computer-implemented method of claim 33, wherein the server continues to request and analyze the other content until a threshold amount of keyword information has been generated.

36. The computer-implemented method of claim **33**, wherein the server continues to request and analyze the other content until all of the other content of the web page has been analyzed.

37. A system comprising:

at least one processor;

at least one interface configured to exchange information with at least one client device that stores a web page comprising uniform resource locator (URL) information identifying the web page and other content; and

a memory, wherein the system is operable to:

receive from the client device one or more portions of the other content of the web page;

analyze the other content received from the client device to generate keyword information based on comparing the other content of the web page with information in a keyword taxonomy, generating keywords that are not presently included in a keyword taxonomy database, and adding the newly generated keywords to the keyword taxonomy database;

communicate a request to an advertisement server for advertisement information relating to the keyword information;

receive from the advertisement server the advertisement information;

rank the advertisement information based, at least in part, on ranking advertisements based on information indicating a likelihood of a user clicking on the advertisements;

select an advertisement to be inserted into the web page based, at least in part, on the ranking;

generate web page modification instructions that, when processed at the client device, modify how the web page is displayed on the client device; and

communicate the web page modification instructions to the client device, wherein the web page modification instructions, when processed by the client system:

insert the advertisement into the web page; and

cause a URL request to be transmitted to the server based on detecting an action that includes a click event, wherein the URL request includes embedded information enabling the server to identify various information about an advertisement selected, via the click event, by the user of a user of the client system.

* * * * *